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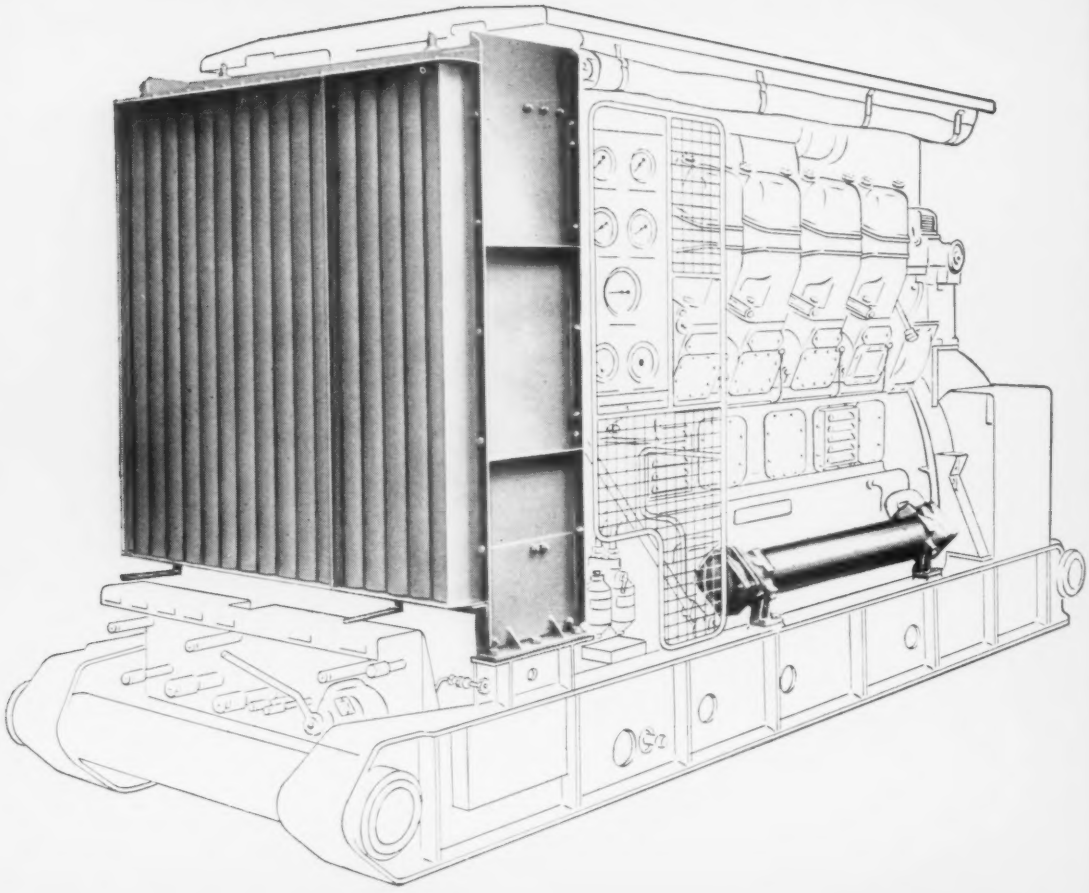

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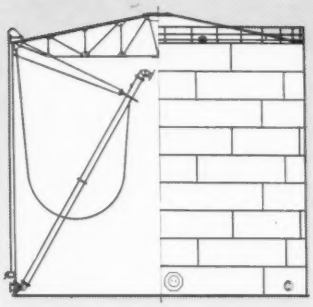

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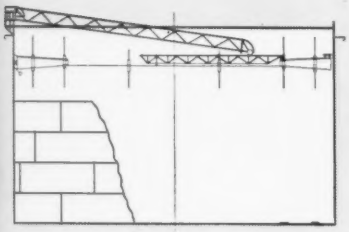

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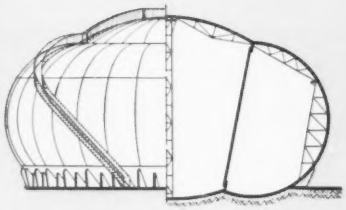

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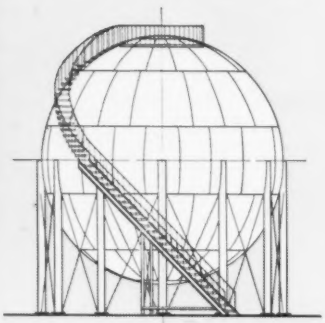
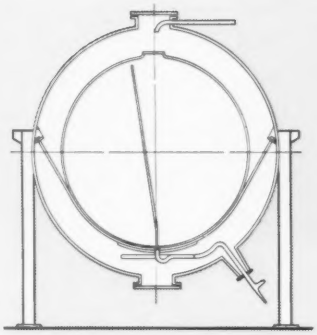


Spheres for the high pressure storage of gases, e.g. butane, propane, town gas, etc.



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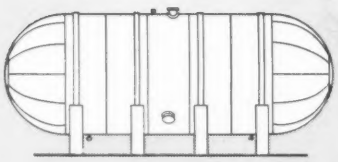

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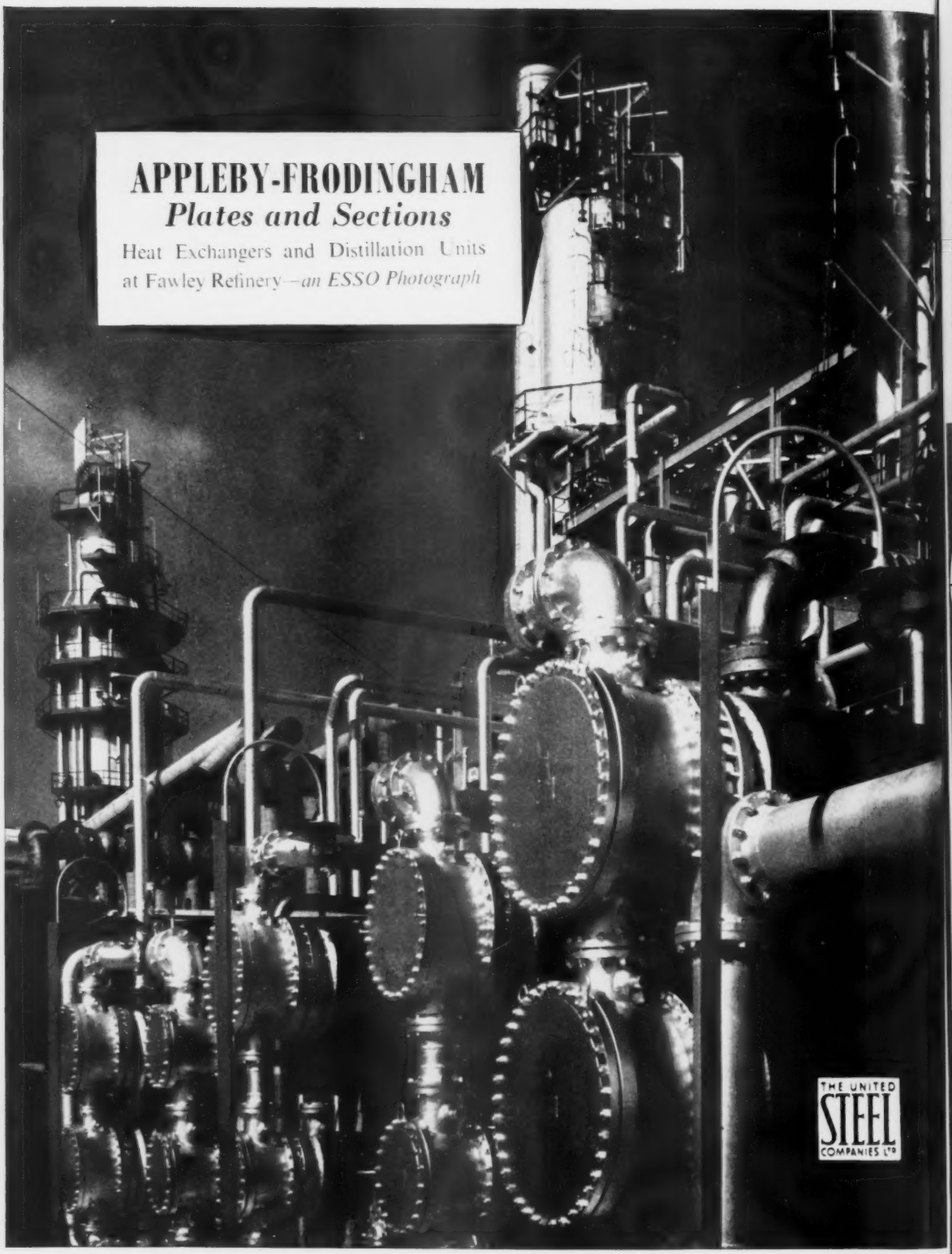

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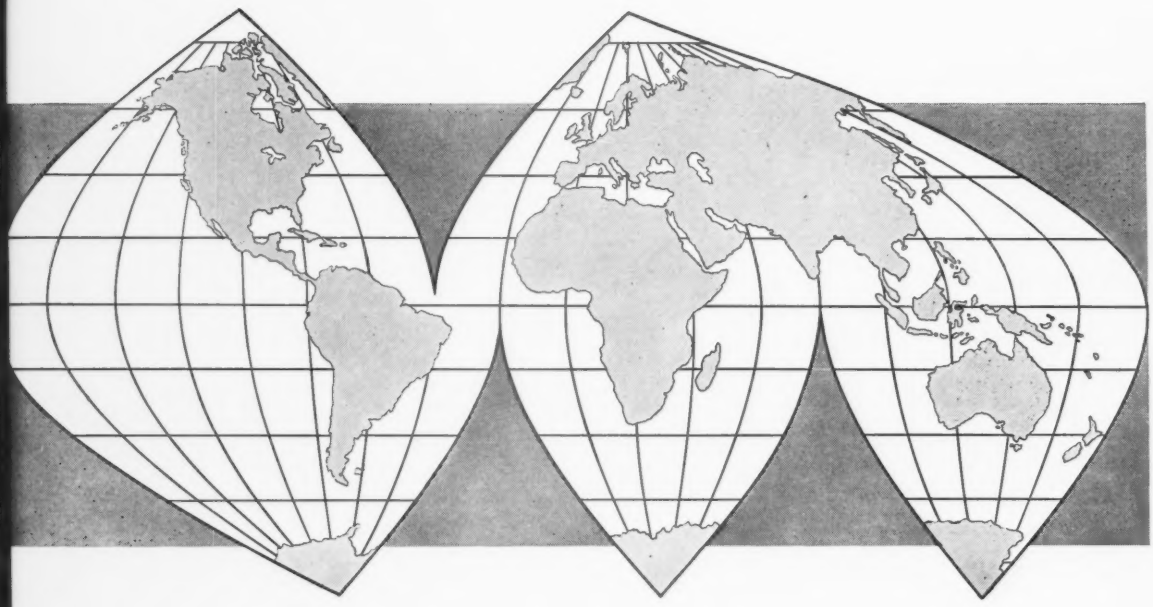

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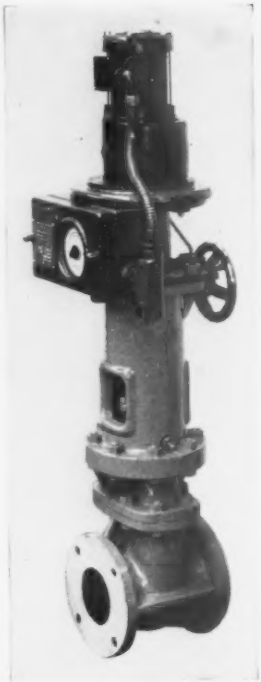

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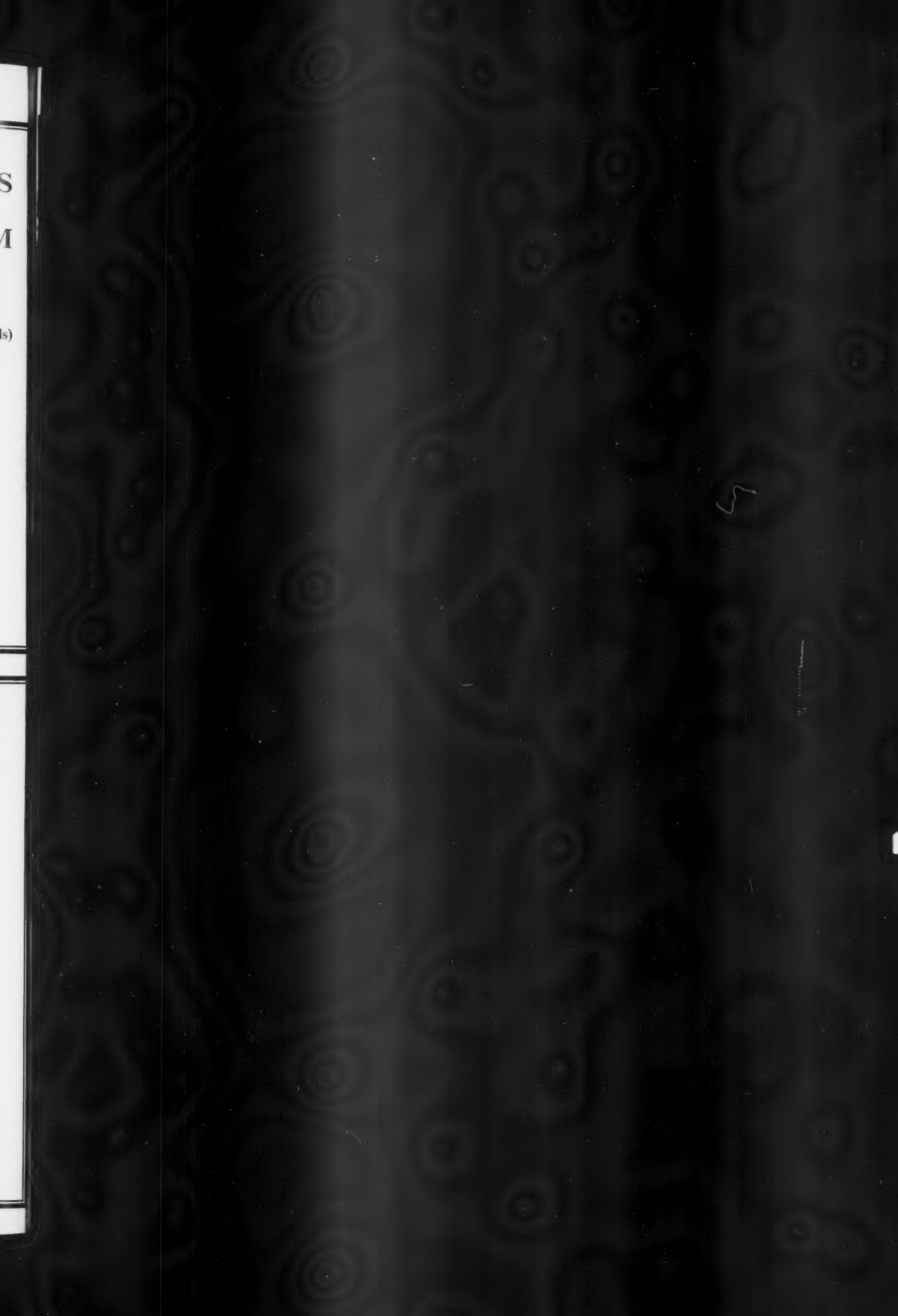

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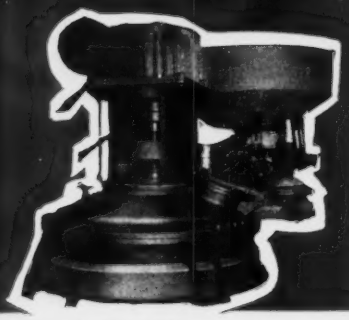
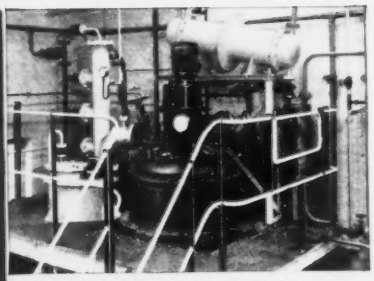
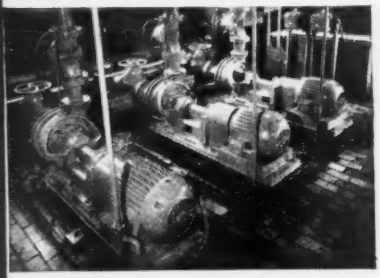


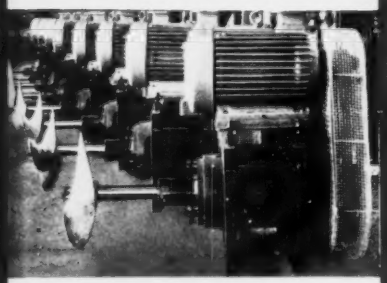
Large kettle installed in a grease plant.



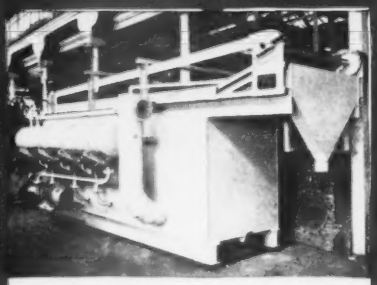
Resin making plant with electric induction heating.



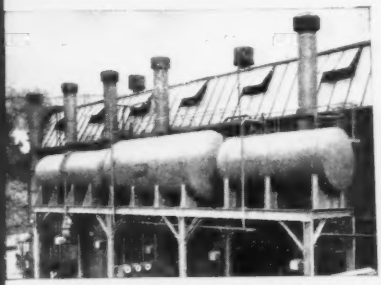
Battery of Mitchell centrifugal acid pumps in a rayon factory.



Battery of large side-entry mixers for petroleum blending.



Gibbs air flotation cell plant for the removal or recovery of greasy residues.



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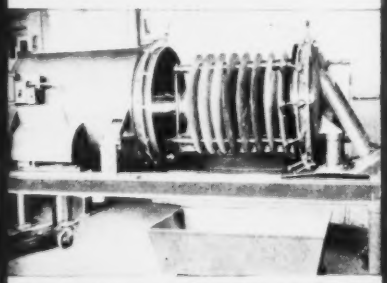

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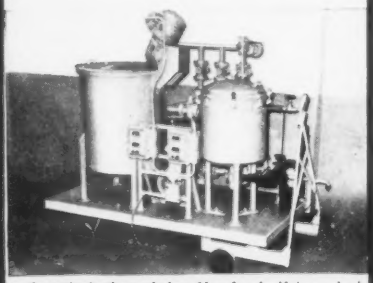
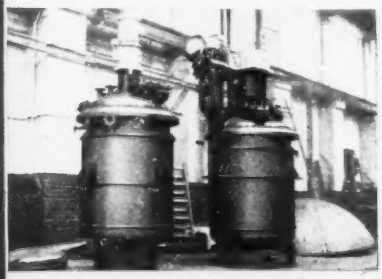
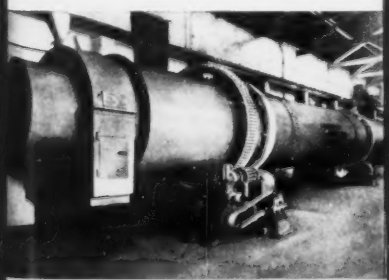


Sparkler horizontal plate filter for clarifying resins.



Kettle and autoclave for grease manufacture.



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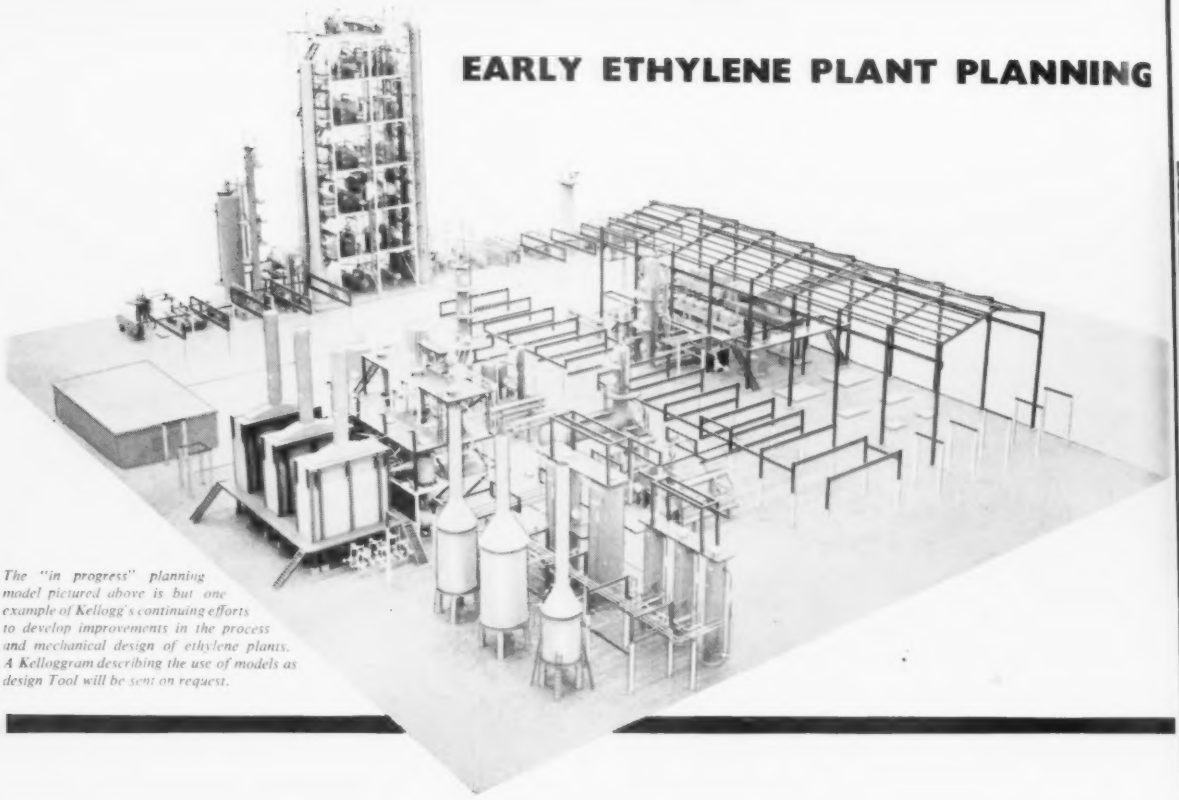

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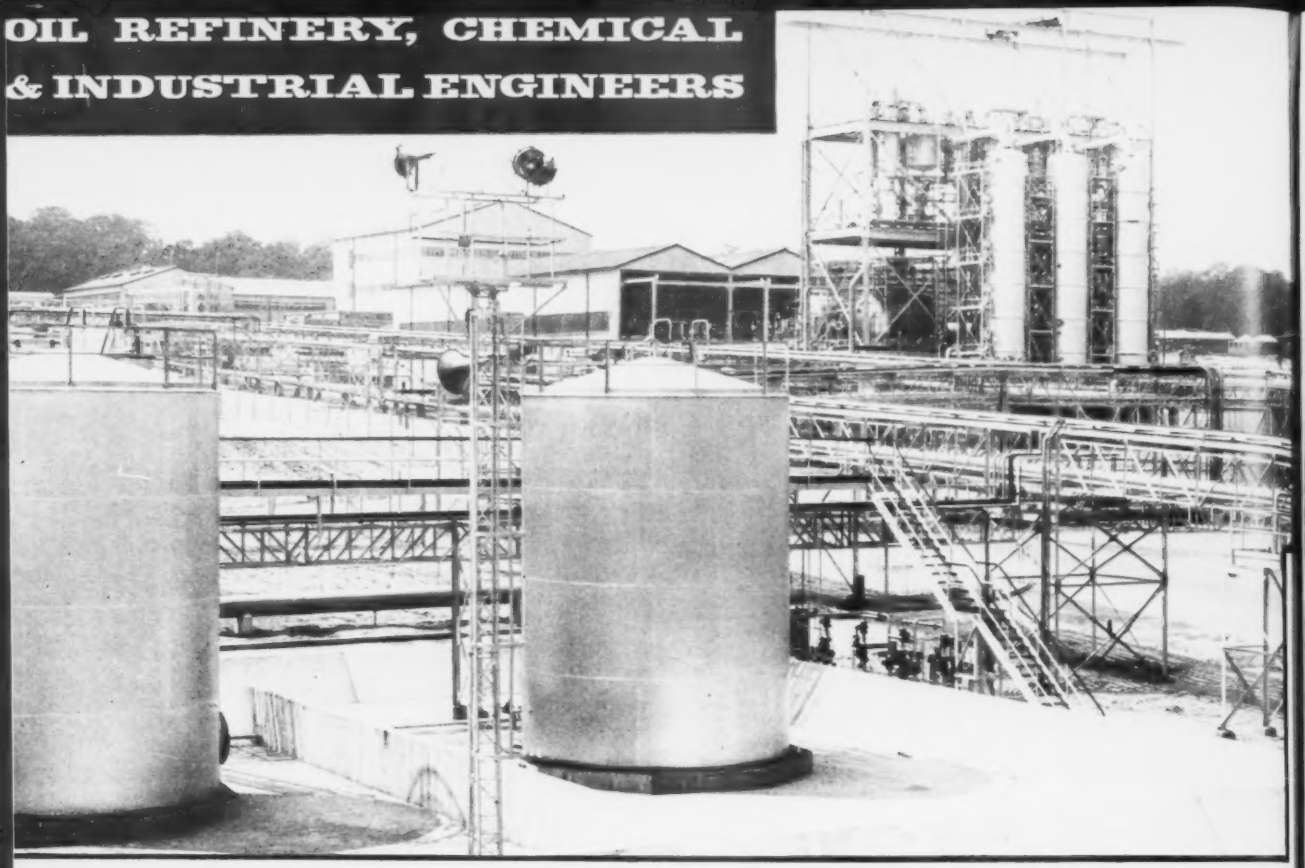

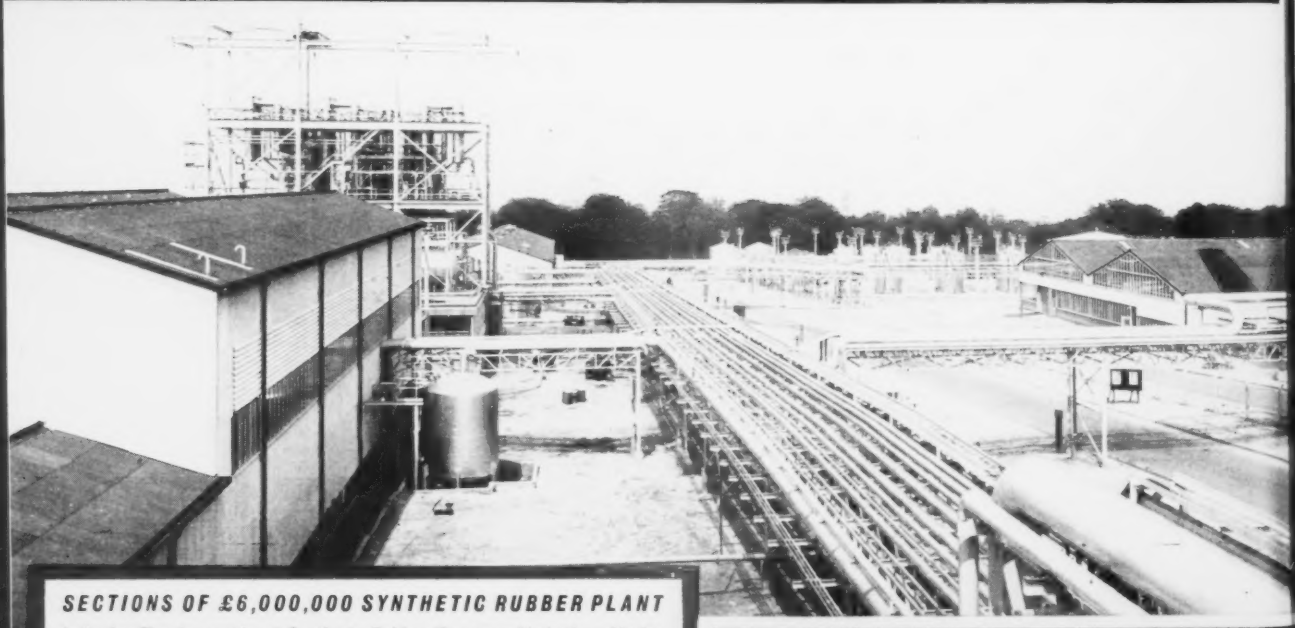

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Petroleum Chemicals Production at Grangemouth

Expansion of BHC Plant

On 17 October the Secretary of State for Scotland, the Rt Hon John S. Maclay, C.M.G., M.P., inaugurated the latest expansion of the Grangemouth works of British Hydrocarbon Chemicals Ltd. The inauguration was performed by the driving of the first pile.

Facilities for the production of olefins for the manufacture of petroleum chemicals will be more than doubled by the installation of a third ethylene plant, the capacity of which will be greater than the combined total of the existing two units. It will be the largest outside the U.S.A. and much bigger than any other so far planned in Europe.

Additional ethylene produced by the new plant, which is scheduled for completion in mid-1960, will enable new plants under construction and existing plants to be operated at full capacity. It will also provide sufficient ethylene and other olefins to enable a further development programme to be undertaken.

Other plants now under construction include a "Rigidex" polyethylene plant and a phenol plant. When the project is completed the total investment of BHC will be over £30 million

J. M. Pattinson, C.B.E., chairman of British Hydrocarbon Chemicals Ltd, speaking at the luncheon preceding the inauguration, said that the input of feedstock to the existing ethylene plant was upwards of 400,000 tons a year. When the expansion was completed it would be doubled. When it began in 1951 the plant was producing two products only—ethyl alcohol and isopropyl alcohol. The range had widened

A general view of the petroleum chemical plants at Grangemouth

The Secretary of State for Scotland cuts the tape to start the first pile on its way. With him are J. M. Pattinson, C.B.E. (centre) *and C. E. Evans, O.B.E., general manager of British Hydrocarbon Chemicals Ltd*

greatly and they would soon be making polyethylene plastic.

The new expansion would consist, said Mr Pattinson, mainly of a new ethylene plant with a rated production capacity of 70,000 tons ethylene annually. With its utilities and services it was estimated to cost about £6 million.

The Rt Hon John S. Maclay, C.M.G., M.P., said that the most striking development in the history of Grangemouth in the last ten years had been based almost entirely on the oil refining and chemical industries. Some 2400 workers were now employed in those industries.

The rise of the oil refining industry in Grangemouth was, in a sense, a counterpart to the decline in the shale oil industry of West Lothian. The products extracted from oil by British Hydrocarbon Chemicals and its associated companies were the raw materials for other manufacturers. Mr Maclay said he hoped that before long a wider range of industrial production would be attracted to the area.

BHC AND ITS ASSOCIATES

British Hydrocarbon Chemicals Ltd was formed in October 1947 as a joint interest by the British Petroleum Company Ltd and The Distillers Co. Ltd under the name of British Petroleum Chemicals Ltd. In April 1950 BHC jointly formed with Monsanto Chemicals Ltd a new company, Forth Chemicals Ltd, to produce monomeric styrene. Five years later, in January 1955, Grange Chemicals Ltd was formed in conjunction with Oronite Chemical Company (a subsidiary of Standard Oil Company of California) to produce detergent alkylate.

PLANT DEVELOPMENTS

The first BHC units, which came into operation in 1951, cracked a petroleum spirit taken from the adjoining refinery of BP Refinery (Grangemouth) Ltd to produce ethylene and propylene. In December 1956 a second cracking and gas separation plant and a duplicate ethanol plant were commissioned, a butadiene plant having been put into operation a month before. The latest plant—a tetra-propylene unit—was commissioned in March 1957.

The first styrene plant of Forth Chemicals Ltd was brought into operation early in 1953 and its capacity more than quadrupled in 1956. The plant of Grange Chemicals Ltd was completed at the end of 1955.

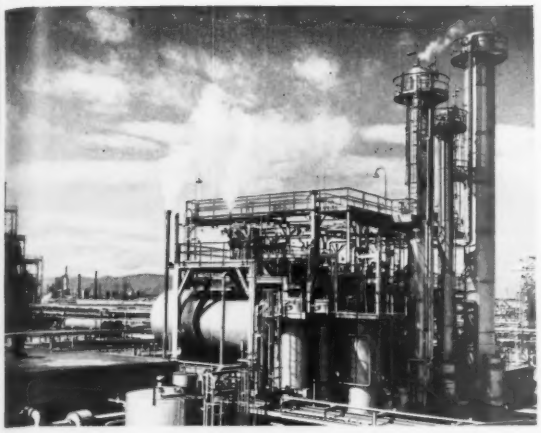
BHC OPERATIONS

The operations of British Hydrocarbon Chemicals Ltd are illustrated in the accompanying simplified flow chart and are divided into the following main processes.

Cracking

The raw material received from the adjoining Grangemouth oil refinery is a petroleum distillate consisting mainly of

Petroleum chemicals operations at Grangemouth



Fractionating columns of No. 1 ethanol plant

paraffins. After mixing with steam the mixture is heated to 1350° F in a cracking unit of one of the ethylene plants and reformed into a gaseous mixture of ethylene (C_2H_4), propylene (C_3H_6), and other compounds. To check the tendency to re-combine, the mixture is quickly cooled by heat exchange to 650° F and then by injection of cold "quench oil" to 175° F. The cracked products are then distilled off and the quench oil drawn off for re-use.

Gas Separation

The gas mixture then passes to a gas-separation plant where its components are separated by fractionation. The extracted distillate and fuel oil are returned to the oil refinery and the gases are separated and purified. This process operates at temperatures down to —150° F and at pressures of about 500 psi. An important preliminary is the removal of sulphuretted hydrogen by means of caustic soda, followed by complete removal of water, compression and refrigeration, and fractional distillation in highly efficient columns. The final products are purified ethylene and propylene, and a residual mixture for further treatment.

Ethyl Alcohol Production

The ethylene is then passed to an ethanol unit where it is combined with water under pressure at a high temperature. The mixture is passed over a catalyst and cooled quickly to produce a weak aqueous solution of ethyl alcohol, C_2H_5OH. This is purified to a final product containing 92·4 per cent by weight of pure alcohol.

Diethyl Ether

The small amount of diethyl ether produced when converting ethylene to ethanol is recovered and marketed as a technical grade product.

Isopropyl Alcohol

To obtain isopropyl alcohol from propylene the first stage is to contact the latter with sulphuric acid in counter current flow. The propyl hydrogen sulphate formed is diluted with water and the acid regenerated as a dilute solution, and isopropyl alcohol formed. This is purified and concentrated to yield a constant-boiling mixture of 87 per cent isopropanol (C_3H_7OH) and 13 per cent water.

Tetrapropylene

Propylene is passed at high temperature and pressure through reactors and selectively polymerized in the presence of a catalyst. The tetrapropylene, $C_{12}H_{24}$ is separated from the effluent and refined to meet stringent specifications.

Butadiene

The C_4 fraction of the residual gases from the gas-separation units is treated with a selective solvent in the butadiene plant. The butadiene is recovered from the solvent and re-distilled to high purity.

Polyethylene

The new polyethylene plant now under construction will yield a high-density product from the polymerization of ethylene at low pressures. The process is licensed from the Phillips Petroleum Company.

Phenol and Acetone

Construction has started on a new plant for the manufacture of these products. Propylene and benzene are reacted over a catalyst to produce cumene (isopropyl benzene). Oxidation of the cumene by The Distillers Company's process is then followed by breakdown of the oxidation products into phenol and acetone, which are purified by fractionation.

ASSOCIATED WORKS

Forth Chemicals Ltd

The main product of this Company is styrene monomer, produced from ethylene obtained from BHC and benzene bought from indigenous sources.

The first stage of the reaction is the alkylation of benzene with ethylene to form ethyl benzene. In the second stage, the latter is dehydrogenated to styrene. Some toluene and small quantities of other reaction products are also obtained.

Grange Chemicals Ltd

Production of detergent alkylate (dodecyl benzene) is the Company's main activity. Tetrapropylene from BHC and partly from BP Refinery (Grangemouth) Ltd is alkylated with benzene in the presence of hydrofluoric acid to form dodecyl benzene (tetrapropylene benzene). Some by-products are also available.

Butadiene plant in foreground and tetramer plant behind

World Tanker Statistics Third Quarter 1958

Oil tankers under construction in the world amounted to 366 ships of 5,522,289 gross tons during the third quarter of 1958. This was 264,314 tons above the figure for the second quarter of the year and accounted for 54·1 per cent of the total tonnage of merchant shipping under construction in the world, states *Lloyd's Register Shipbuilding Returns* for the Third Quarter of 1958.

The increasing ratio of steam as opposed to motor propulsion continued in the third quarter. There were 175 steam tankers under construction, of 3,939,626 tons compared with 191 motorships of 1,582,663 tons.

In Britain at the end of September, 77 tankers of 1,150,571 gross tons, were under construction. This is 40,581 tons more than in the previous quarter and represents 50 per cent of the total tonnage under construction in the U.K.

Britain leads as country of registration of tankers under construction with 87 vessels of 1,334,962 gross tons. Second place is taken by Liberia with 33 ships of 832,353 gross

TABLE I

REGISTRATION OF OIL TANKERS UNDER CONSTRUCTION AT END-SEPTEMBER 1958

Country of registration	*No.*	*Gross tonnage*	*Country of build*	*No.*	*Gross tonnage*
Britain ...	87	1,334,962	Britain ...	68	1,018,111
			Belgium ...	3	58,000
			France ...	1	22,000
			Germany ...	5	38,116
			Italy	8	186,000
			Unspecified ...	2	12,735
Canada ...	3	27,600	Commonwealth	2	25,800
			Netherlands ...	1	1,800
Belgium ...	5	67,881	Britain ...	1	11,760
			Belgium ...	1	13,066
			France ...	2	42,700
			Germany ...	1	355
Brazil ...	4	68,000	Germany ...	1	5,000
			Netherlands ...	3	63,000
Denmark ...	10	165,100	Britain ...	2	42,000
			Denmark ...	7	110,400
			Japan ...	1	12,700
Finland ...	1	12,000	Netherlands ...	1	12,000
France ...	11	253,110	Denmark ...	1	18,590
			France ...	10	234,520
Germany ...	29	142,321	Germany ...	29	142,321
Iran	2	42,000	Netherlands ...	2	42,000
Irish Republic	1	12,000	Britain ...	1	12,000
Israel ...	1	27,500	Japan ...	1	27,500
Italy	21	250,817	Italy	21	250,817
Japan ...	19	155,060	Japan ...	19	155,060
Kuwait ...	1	27,650	Japan ...	1	27,650
Liberia ...	33	832,353	Britain ...	1	12,500
			Belgium ...	1	18,500
			Germany ...	3	77,013
			Japan ...	13	357,690
			Netherlands ...	5	79,500
			Sweden ...	2	41,150
			U.S.A. ...	8	246,000
Netherlands ...	16	173,347	Germany ...	6	6,347
			Japan ...	1	21,400
			Netherlands ...	9	145,600
Norway ...	38	579,060	Britain ...	3	41,700
			Denmark ...	2	24,500
			France ...	1	13,300
			Germany ...	7	123,250
			Netherlands ...	4	61,450
			Norway ...	15	212,970
			Sweden ...	6	101,890
Panama ...	16	355,563	Commonwealth	1	139
			Italy	7	143,025
			Japan ...	4	104,150
			Sweden ...	1	26,450
			U.S.A. ...	3	81,800
Peru	1	4,297	Unspecified ...	1	4,297
Poland ...	2	25,500	Poland ...	1	12,000
			Jugoslavia ...	1	13,500
Portugal ...	2	29,000	France ...	1	13,000
			Unspecified ...	1	16,000
Russia (U.S.S.R.)...	4	13,320	Finland ...	4	13,320
Spain ...	12	130,910	Spain ...	12	130,910
Sweden ...	10	148,055	France ...	1	22,050
			Italy	1	12,700
			Sweden ...	8	113,305
Switzerland ...	4	5,460	Germany ...	4	5,460
U.S.A. ...	24	495,623	Japan ...	2	49,400
			Sweden ...	1	40,000
			U.S.A. ...	21	406,223
Yugoslavia ...	2	15,400	Yugoslavia ...	2	15,400
Unspecified ...	7	128,400	Britain ...	1	12,500
			Belgium ...	1	12,000
			Germany ...	2	21,900
			U.S.A. ...	2	66,000
			Unspecified ...	1	16,000

Of the 366 oil tankers under construction, totalling 5,522,289 gross tons, 227 of 3,006,800 gross tons are for registration in country of build.

tons; third is Norway with 38 ships of 579,060 gross tons; and next is the U.S.A. with 24 vessels of 495,623 gross tons, displacing Panama from its previous fourth position. Full details can be seen in Table I.

Yet again Germany maintains, with 58 ships, second place to Britain in the actual number of tankers building. As in other recent quarters, however, the actual tonnage concerned is much less than that of the U.S.A., which has 800,023 gross tons compared to Germany's 419,762. Table II lists tankers under construction, with their country of build and type of propelling machinery.

During the third quarter Britain commenced 11 tankers, launched 19, and completed 8. Japan commenced 24, launched 26, and completed 29. Germany commenced 24, launched 22, and completed 24. The United States commenced 10, launched 7, and completed 6. Details of launchings appear in Table III.

TABLE II

OIL TANKERS UNDER CONSTRUCTION AT END-SEPTEMBER 1958

Country of build	*Steam*		*Motor*		*Total*	
	No.	*Tons gross*	*No.*	*Tons gross*	*No.*	*Tons gross*
Great Britain & N. Ireland ...	41	865,370	36	285,201	77	1,150,571
Other C'lth Countries	1	24,000	2	1,938	3	25,938
Belgium ...	3	60,500	3	41,066	6	101,566
Denmark ...	—	—	10	153,490	10	153,490
Finland	—	—	4	13,320	4	13,320
France	11	248,070	5	99,500	16	347,570
Germany ...	16	320,613	42	99,149	58	419,762
Greece	—	—	1	16,000	1	16,000
Italy	25	538,460	12	54,082	37	592,542
Japan	26	669,490	16	86,060	42	755,550
Netherlands ...	14	282,950	11	122,400	25	405,350
Norway ...	1	18,500	14	194,470	15	212,970
Peru	—	—	1	4,297	1	4,297
Poland	—	—	1	12,000	1	12,000
Portugal ...	—	—	3	28,735	3	28,735
Spain	1	22,000	11	108,910	12	130,910
Sweden ...	3	91,450	15	231,345	18	322,795
U.S. of America	33	798,223	1	1,800	34	800,023
Yugoslavia ...	—	—	3	28,900	3	28,900
World Total ...	175	3,939,626	191	1,582,663	366	5,522,289

TABLE III

OIL TANKERS LAUNCHED DURING THE THIRD QUARTER OF 1958

Country of build	*Steamships*		*Motorships*		*Total*	
	No.	*Tons gross*	*No.*	*Tons gross*	*No.*	*Tons gross*
Great Britain & N. Ireland ...	8	138,378	11	80,286	19	218,664
Other British C'lth Countries	—	—	2	1,938	2	1,938
Belgium ...	2	39,500	—	—	2	39,500
Denmark ...	—	—	2	30,790	2	30,790
Finland	—	—	1	3,330	1	3,330
France	2	44,050	1	13,300	3	57,350
Germany ...	4	81,750	18	15,148	22	96,898
Greece	—	—	—	—	—	—
Italy	1	20,760	2	25,025	3	45,785
Japan	10	246,150	16	32,190	26	278,340
Netherlands ...	2	45,950	1	433	3	46,383
Norway ...	—	—	4	57,940	4	57,940
Peru	—	—	1	4,297	1	4,297
Portugal ...	—	—	2	1,468	2	1,468
Spain	—	—	—	—	—	—
Sweden ...	—	—	5	85,515	5	85,515
U.S. of America	7	155,023	—	—	7	155,023
World Total ...	36	771,561	66	351,660	102	1,123,221

★ ★ ★

Piping Refinery Gases

A. D. L. Copp, of the North Thames Gas Board, spoke on the construction, operation, and future use of high pressure lines in the gas industry, at a recent meeting of the Pipeline Industries Guild (of which he is a Founder Member). S. J. Manning presided.

By means of a film Mr Copp illustrated a 24-inch diameter pipeline which has been constructed for the North Thames Gas Board to carry gas from oil refineries in the Thameshaven area for treatment at the Romford gasworks, a distance of 24½ miles.

Other preliminary work included building a plant for the removal of sulphur from the gas at the oil refinery and the laying of a main to the boundary of the refinery; at the Romford gasworks there were four reforming plants, each to deliver one million cu. ft. of the reformed gas per day. The gas will then be equal in all respects to the normal town gas and will be fed into the grid system.

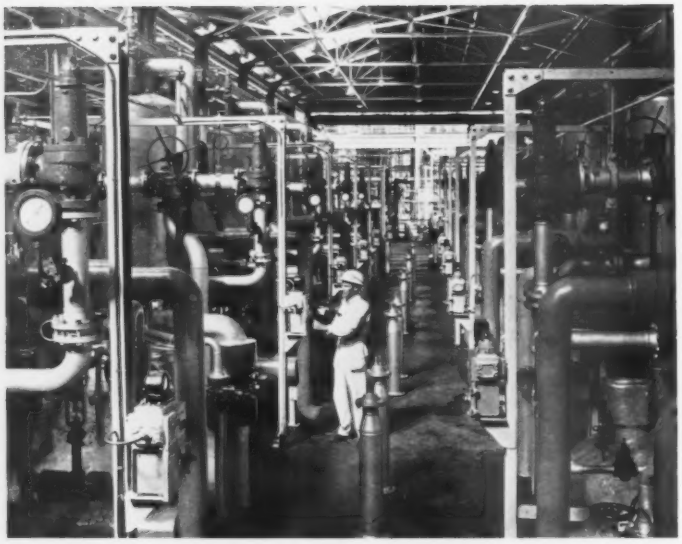
The film described the construction of the pipeline in the various stages.

Mr Copp said that the cost of the works necessary for conveying the gas from the refineries and treating it at the Romford gasworks was only about a quarter of the cost of a conventional gasworks of comparable output.

The film, he said, indicated that the conditions under which pipelines had to be laid in the U.K. were very different indeed from those applying to the laying of enormously long pipes in the Middle East and other parts of the world.

He touched briefly on the history of the gas industry, and of changes that had occurred in the making of gas. Conventional coal carbonization was the only method used until towards the end of the last century, when the water gas process was introduced. Oil was first used for gassing when carburetted water gas was introduced, the oil gas being used to improve the calorific value of the former.

Speaking of natural gas, Mr Copp referred to the gas well in the north-east of England and said it was not known for how long it would continue to give gas. A natural gas well was always on an anticline, and if we could find the geological formation of an anticline we should have a ready made gasholder. Its contents could be pumped out, and the gas industry could level out demand very economically by storing gas there in the summer and taking it out during winter.



The operation floor of the reactor building at Hythe

Britain's First Synthetic Rubber Operation

The Hythe Plant of ISR

With a capacity of up to 70,000 tons a year of general purpose synthetic rubber, the new plant of The International Synthetic Rubber Company Ltd (ISR) at Hythe on Southampton Water is Britain's first venture into the bulk manufacture of this material. Production commenced in March and reached full-stream output in July.

The synthetic rubber produced at Hythe is styrene-butadiene rubber (SBR), known more familiarly from the war years as GR-S (Government rubber-styrene). As the name implies, the main ingredients of SBR are styrene and butadiene. The latter is piped into the plant from the nearby Fawley refinery of Esso Petroleum Company Ltd, and the styrene is supplied from the Grangemouth plant of Forth Chemicals Ltd and from the Partington plant of Shell Chemical Company Ltd. This material transported in road or rail tankcars or in sea tankers. In order to prevent the raw materials polymerizing during transit to the site, tertiary butyl catechol is added as an inhibitor.

Built on a 54-acre site, the present installations cover an area of 280,000 square feet, leaving room for expansion as required. Within the plant there is over 50 miles of pipeline, and storage capacity is provided for butadiene (350,000 gal), styrene (240,000 gal), process oil (120,000 gal), antioxidant (33,000 gal), salt water (1 mil gal), other water (93,000 gal), and latex (125,000 gal).

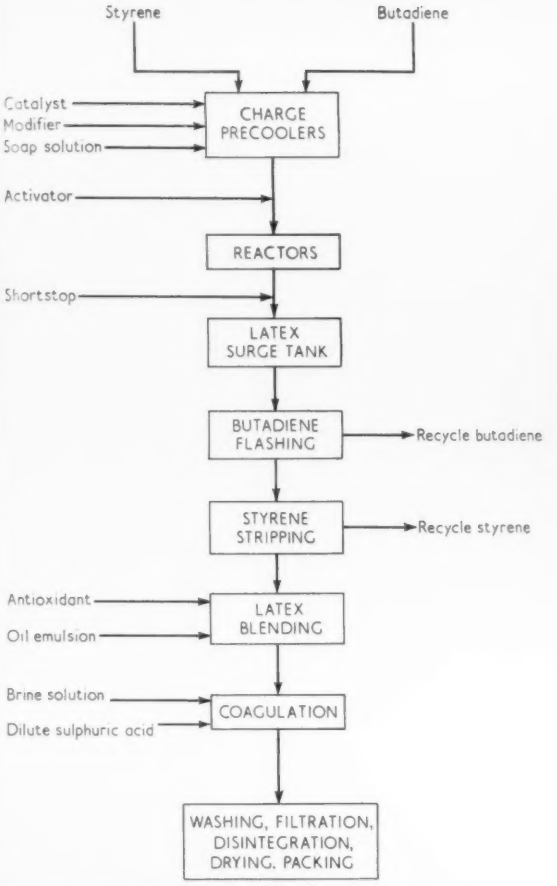
Annual butadiene consumption is about 50,000 tons; styrene 13,000 tons; fuel oil, 2·5 mil gallons.

All units liable to breakdown are duplicated and consequently the production of SBR can proceed continuously day and night.

Design, installation, and commissioning of the plant was in the hands of the Blaw-Knox Company of Pittsburg, Pennsylvania, the specialized resources for the undertaking not being available in the U.K. Engineering and procurement was sub-contracted to Matthew Hall & Company Ltd, of London, and civil engineering was by John Laing & Company Ltd.

The capacity of the Hythe plant represents about 27 per cent of the present U.K. total demand for rubber of all types. Equity capital of ISR has been subscribed by the U.K. tyre companies. The percentage of synthetic rubber in motor car tyres to-day is about 45, and it also has many other applications in industry.

The recovery building showing the styrene strippers to the left



Simplified flow chart of SBR process at Hythe

The brand name for ISR is "Intol" and three main types will be manufactured—Intol 1500, Intol 1532, and Intol 1710. The latter is a rubber extended by 31·5 per cent of a special aromatic oil.

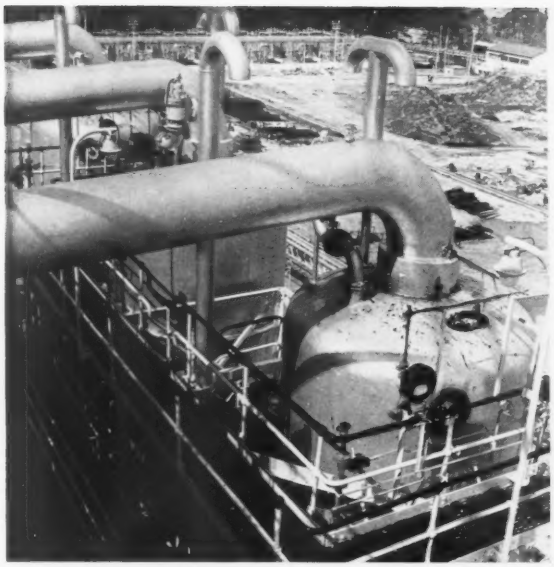
The Process

The plant is designed to produce SBR by a low-temperature polymerization reaction, the process briefly being as follows.

Fresh and recycle butadiene are blended and washed with aqueous caustic soda to remove the inhibitor and then pumped via surge tanks to the reactor train. Blended fresh and recycle styrene is also fed through surge tanks to the reactor train, as also is the emulsifying solution consisting of rosin or fatty acid soap and other materials dissolved in water. This mixture, including redox catalyst and modifier, is then cooled to 41°–55° F and the activator solution added at the point of entry to the reactors.

When the reaction has reached the desired stage, the material passes through a series of displacement columns where the reaction is stopped by the addition of a shortstop.

The latex thus produced passes to a latex surge tank and is heated by direct addition of steam. Butadiene is then removed, first in pressure flash tanks and then in vacuum



Styrene strippers as seen from the top of the recovery building

flash tanks and pumped to the recycle butadiene storage tank. Unreacted styrene is next removed by steam stripping under vacuum and the completely stripped latex passed to storage.

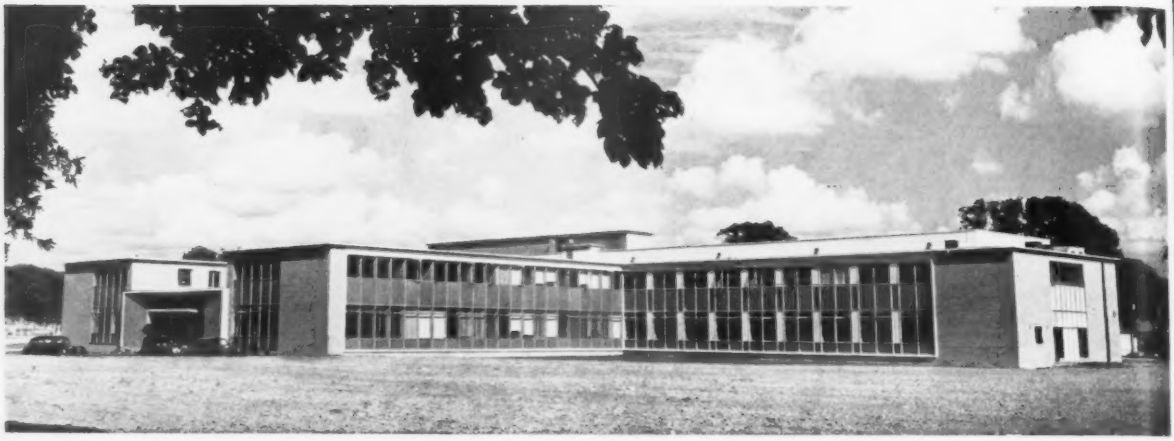
The next stage is to coagulate the latex and remove the aqueous medium, but first an antioxidant must be added to retard oxidation. If desired, an oil extender is also added before coagulation.

Latex is coagulated by the action of a brine solution and dilute sulphuric acid, yielding a slurry of rubber crumb. The aqueous medium is removed by filtration, the rubber washed with dilute filtrate and the liquid partially removed by vacuum and squeeze rolling. The cake of rubber crumb is broken down in a hammer mill to discrete crumbs, which are dried in a three-conveyer drier to a moisture content of 0·5 per cent by weight.

From the drier, the rubber is weighed and baled into 80 lb bales, which are then film wrapped and bagged for storage prior to despatch. The storage building can accommodate 3000 tons of synthetic rubber.

A more detailed account of this process will be found in the paper by K. G. Burridge, of ISR, in the March issue of the *IP Review* on pages 96–100.

Packages of SBR ready for despatch to purchasers



The new laboratories of Esso Research Ltd

Esso Research Centre Opened

Formally opened by the Rt Hon The Viscount Hailsham, Q.C., Lord President of the Council, the new Abingdon laboratories of Esso Research Ltd are the largest Esso research centre in the Eastern Hemisphere. Built and equipped at a cost of about one million pounds, the centre is designed to serve the interests of all Esso companies operating in Europe and North Africa.

In the course of his address, **Lord Hailsham** said it was appropriate that a member of the Government should applaud and recognize the work done by a private industry in promoting research. Research profited industry and would also benefit Britain.

He did not think that as a nation we knew, thought, or talked enough about research. The view of the Advisory Council on Scientific Policy, reported last year, was that the resources devoted to civil research and development in Britain had been and still were too small. It required attention at many levels and by many varieties of interest.

The present state of aviation development and of radar, electronics, and space travel, was largely the product of military research in two world wars. It was impossible, said Lord Hailsham, not to speculate on what would be the result if the Government spent £200 million on civil research and £20 million on military research, instead of virtually the opposite.

In the realm of research, Government expenditure was not the only source of money. Industry, the maker and user of civil machines, was and should be the prime patron of industrial research. Research could also be competitive and gained by being so, since duplication of research was not necessarily as wasteful as som ,nds of effort.

Under the general control of a Committee of the Privy Council, an Overseas Research Council was to be set up to deal with scientific research overseas. His lordship hoped this would be the beginning of new scientific links between members of the Commonwealth.

Concluding, Lord Hailsham said that no industry, no individual, nor any nation could afford to neglect research.

Unveiling a plaque and declaring the laboratories open, he said he hoped that their discoveries would be beneficial to the industry supporting them and also to the human race.

C. S. Windebank, managing director of Esso Research Ltd, said that altogether the Esso organization spent £20 million annually on research. Abingdon watched the specific needs of the Esso companies in Europe and Africa. The high quality kerosine of recent years had been designed there; they had developed additives to stop ice choking the carburettor in winter, and had invented the only oil which could lubricate high performance jet aircraft. A lot of their work was done in the field. For instance, diesel fuels had been studied under cold conditions in the Bavarian Alps, asphalt road materials in Stockholm, and petrol in every area.

Their job, said Mr Windebank, was the advancement of the technology of petroleum. Modern scientific developments were used in their work and they believed that the main advances in science and in engineering should be made in universities and other independent institutions.

H. C. Tett, chief executive and managing director of Esso Petroleum Company Ltd, welcomed the guests, and said that his Company had a direct interest in the work of Esso Research. British industrial expansion had owed much to research. The major use for petroleum had changed three times in one ordinary lifetime and we were now entering the petroleum chemical age.

Even more remarkable than the thousands of uses discovered for refined oil was the growth of its consumption. In 1888, when his Company was formed, said Mr Tett, Britain used 94 million gallons of oil. At present that amount was used in five days. That growth required a vast investment in capital equipment. Something like £15,000 was required for every additional ton per day of oil found and marketed.

Concluding, Mr Tett said that research provided an invaluable means for planning the strategy of future investment. It gave the third eye.

After the opening ceremony the laboratories and buildings were open for inspection. These will be described in some detail in a forthcoming issue.

Fifth World Petroleum Congress

Technical Sessions Outlined

H. S. M. Burns, president of Shell Oil Company and chairman of the board of directors of the American Petroleum Institute, has accepted the presidency of the Fifth World Petroleum Congress. As Congress president, he will preside at the more important functions planned for the meeting.

The Congress is being held in New York 30 May to 5 June 1959, and is expected to draw 5000 to 6000 executives, scientists, and technologists from 50 countries.

Technically, the Fifth World Petroleum Congress promises to bring to the industry much new and valuable information in all branches of petroleum technology.

In addition to the nine main sections, which are similar in scope to those of the previous Congress, there is a special symposium on the important subject of the applications of atomic energy to the petroleum industry.

The tentative arrangements provide for morning and afternoon sessions each day from Monday to Friday (1 to 5 June) and at each session three or at the most four papers will be presented for discussion, In the case of Section I it will be necessary to have parallel sessions on several days in order to accommodate the large number of papers put forward in that Section.

At the time of writing only brief details are available as to the papers which are to be read but the following summarizes the present knowledge.

SYMPOSIUM ON APPLICATIONS OF ATOMIC ENERGY

It is proposed to open the symposium with a general paper covering the impact of atomic energy on the petroleum industry throughout the world. The peaceful uses of atomic explosives will also be discussed, as well as the technical and economic prospects of atomic energy in the industry.

A new technique for the control of separation processes by the use of radioisotopes will be described in one paper, while the use of radiotracers for measuring fuels and lubricants performance in an engine will be discussed on a broad basis. The mechanism of recoil tagging of hydrocarbons with carbon 14 and tritium, and the application of this method to petroleum research, will be the subject of another paper.

Several papers will be devoted to radiation chemistry and there are indications that they will discuss hydrocarbon radiolysis, hydrocarbon reactions to radiation, and the application of nuclear radiation in oil processing. In the lubricants field there will be papers on radiation effects on stability of synthetic lubricants and on the requirements of nuclear power plants. The use of nuclear physics in oil prospecting and production will also be the subject of one session.

British papers in the symposium are:

Lubrication requirements of nuclear power plants. J. J. Frewing (*The Shell Petroleum Co. Ltd*).

The effect of gamma irradiation on the thermal decomposition of paraffin hydrocarbons. M. F. Hoare, T. A. Garbett, and R. E. Pegg (*Esso Research Ltd*).

SECTION I—GEOLOGY AND GEOPHYSICS

As mentioned above, this is the largest section of the Congress and on most days it will be necessary to hold parallel sessions. It is the intention, as far as possible, to arrange that parallel sessions do not clash in interest and it is likely that the division will be on the basis of a session on geology coinciding with one on geophysics.

In the field of geology, two papers have been allocated to the carbonate rocks and one to the study of dolomitization. Salt domes in general and in particular regions will be the subject of four papers, while three contributions will be concerned with the origin and migration of oil.

Regional geology and oil exploration has attracted a number of papers. The areas to be discussed include Sicily, Oman and Hadhramaut, Turkey, Israel, Iran, Pakistan, California, the Gulf Coast, the Atlantic Coastal Plain of the U.S.A., Argentina, Brazil, Holland, Venezuela, the Four Corners area, the Soviet Union, the Congo, French Equatorial Africa, Austria, and Yugoslavia. The tar sands of Alberta will also be described.

Geophysical papers will cover a wide range from the general to the specific. Thus, there will be discussions on general progress of geophysical oil prospecting methods and on special techniques. The application and results obtained by the use of these techniques in certain areas will be the subject of various contributions, the areas including the U.S.S.R., Yugoslavia, the Sahara, Alberta, Chile, the Canadian Rockies, and Germany.

Two British papers are included in this Section:

The use of amplitude and frequency in exploration seismology. P. N. S. O'Brien (*The British Petroleum Co. Ltd*).

The geology of Oman and Hadhramaut. D. M. Morton and Z. R. Beydoun (*Iraq Petroleum Co. Ltd*).

SECTION II—DRILLING AND PRODUCTION

Subjects scheduled for discussion in this Section vary from theories in drilling and production to a dissertation on oil shale as a future energy source. Drilling by new methods, such as the turbodrill and by air and gas, will be of considerable interest, as also should be a paper on the use of bottom-hole movers in high pressure conditions.

Secondary recovery methods to be dealt with will include the fire flood or underground combustion method, as well as the more conventional methods. One paper is also scheduled on the relationship of compressibility factor, liquid gas ratio, and vapour-liquid equilibrium ratio of natural hydrocarbon mixtures at production pressures and temperatures.

The British paper in Section II is:

Recovery problems in a fracture/pore system, Kirkuk field. H. A. Freeman and S. G. Natanson (*Iraq Petroleum Co. Ltd*).

SECTION III—OIL PROCESSES AND REFINING

Papers in this Section will be concerned with the more important processes employed to-day in the refining of petroleum products, dealing first with the need for high

octane fuels. Isomerization, alkylation, and catalytic reforming will all receive attention. Hydrogenation and hydrorefining will be subjects of several papers and the use of various catalysts, including cobalt, molybdenum, and aluminosilicate, will be discussed. In the cracking field one paper is scheduled to report studies on a commercial two-stage catalytic cracking unit.

In dealing with the manufacture of lubricating oils, the hydrofining process will receive some attention and the production of lubricants from sulphurous oils in the U.S.S.R. will be duscussed.

Among the various treating processes on which papers will be presented are, sweetening by catalytic oxidation with sulphur dyes, the extraction of aromatics with sulpholane, and on the adsorptive removal of n-paraffins from gasoline.

The use of digital computors and the application of linear programming to refinery operations will also be discussed.

The British papers in this Section are:

Dehydrogenation of naphthenic lubricating oil fractions. T. F. Brown and P. Mathews (*Lobitos Oilfields Ltd*).

The use of gaseous sulphur trioxide in the sulphonation of petroleum oils. H. Kaye, E. Forsyth, and A. L. Mills (*Manchester Oil Refinery Ltd*).

Refining of steam cracked gasoline. F. W. Porter and P. T. White (*The British Petroleum Co. Ltd*).

SECTION IV—CHEMICALS FROM PETROLEUM AND NATURAL GAS

This Section will be devoted mainly to the production of basic chemical products from petroleum fractions. It will therefore deal with the manufacture and relationships of aromatics, the pyrolysis of hydrocarbons to acetylene and ethylene, the synthesis of hydrocarbons, and similar developments.

On the end uses of chemicals from petroleum there will be several papers on such materials as detergents, acrylonitrile, plastics, synthetic rubbers, and synthetic fibres. There is only one British paper in this Section which is:

Integration of petroleum chemicals operations. D. W. Huebner, W. A. Mason, and J. W. Woolcock (*Imperial Chemical Industries Ltd*).

SECTION V—COMPOSITION, ANALYSIS, AND TESTING

It is indicated that this will open with papers on spectroscopy to be followed with a session on gas chromatography, and a general discussion on both these methods. Petroporphyrins will receive attention as also will the separation and identification of cyclic sulphur compounds.

Hydrocarbon chemistry will receive attention in this Section and one paper will deal with the constitution of high molecular weight petroleum products. The evaluation of lubricants will be the subject of several papers and the relationships of the physical properties of hydrocarbons will also be discussed. The British contribution to this Section is:

Analytical applications for Ion exchange resins in the petroleum industry. W. A. Munday and A. Eaves (*"Shell" Research Ltd*).

SECTION VI—UTILIZATION OF PETROLEUM PRODUCTS

It is scheduled that the first five sessions in this Section will deal with fuels for spark ignition and compression ignition engines. Two papers will deal with development and progress of multi-fuel engines and gas turbines. Octane requirements of spark ignition engines will receive considerable attention.

Lubricating oils and greases will be dealt with from various aspects including the use of thickeners in greases, the development of EP lubricants, the use of additives, and the effects of high temperature friction and wear. The remainder of the Section will be devoted to papers on heating oils, industrial fuel oils, and bituminous products. British papers in this Section are:

Road octane number of past, present, and future gasolines. E. B. V. Potter, D. M. A. Masterman, A. Skull, and C. H. Sprake (*Esso Research Ltd*).

Investigations into the composition of diesel engine exhausts. C. L. Bailey, A. R. Javes, and J. K. Lock (*The British Petroleum Co. Ltd*).

Road and laboratory experiments on asphalt from Western Hemisphere and Middle East crudes. A. Winward, H. I. Fuller, T. Les, and P. J. Way, (*Esso Research Ltd*).

Trends in marine lubrication. G. A. Dickins and L. W. Manley (*Mobil Oil Co. Ltd*).

Industrial applications of residual fuel oil. C. A. Roast and W. E. J. Broom (*Esso Petroleum Co. Ltd*).

SECTION VII—ENGINEERING, EQUIPMENT, AND MATERIALS

A wide variety of topics are included in the papers scheduled for this Section. Pollution prevention, corrosion prevention, steel specifications, will all be discussed as also will the instrumentation and automation of refinery processes. Fire prevention, including the aspect of static electricity, will also be covered and six papers will be from Britain as follows:

Fire-side corrosion in oil-fired boilers. L. K. Rendle, R. D. Wilsdon and G. Whittingham (*The British Petroleum Co. Ltd*).

Corrosion in salt water cooling systems. E. D. Dolan (*The British Petroleum Co. Ltd*).

Quality control in the manufacture of process plant equipment. J. F. Lancaster (*Kellogg International Corporation*).

Pollution prevention through operations and design. A. W. W. Kirby (*Shell Refining Co. Ltd*).

The biological decomposition of naphthenic acids in a refinery effluent disposal stream. R. R. Ferner (*Shell Refining Co. Ltd*).

Noise problems in a large refinery. I. F. S. Robinson and M. Shirley (*Esso Petroleum Co. Ltd*).

SECTION VIII—TRANSPORTATION AND DISTRIBUTION

As might be expected it is proposed to open Section VIII with papers dealing with the sea transport of petroleum, and not the least important of these will be one dealing with the transportation of liquid methane. Tanker design will also be discussed.

As regards storage of petroleum, tankage, earthen reservoirs, and caverns will all come in for attention, and the study of static electricity in fuels will also be raised. In the pipeline field the operation lines by automatic control will be the subject of some papers. Off-shore pipelines and synthetic pipeline coatings will also be studied and on the distribution side the matters to be discussed will include displacement meters and dispatch by truck. The British contribution to this Section will be:

Electrical heating of pipelines carrying viscous products. C. F. Mares (*The British Petroleum Co. Ltd*).

SECTION IX—OPERATIONS RESEARCH, STATISTICS, AND EDUCATION

The place of petroleum in world energy supplies will be foremost among the discussions in this Section and will include contributions on the part petroleum plays in social progress, the financing of petroleum operations, and the rates of return.

Economic trends in the size and location of refineries will be discussed as also will the question of budgeting by operational research. Statistical data, education, and the development of local staff for skilled and professional positions will find their place in this Section, in which there are two British papers:

Better budgeting by operational research. L. J. Govier and E. F. Choppen (*Esso Petroleum Co. Ltd*).

Current economic trends in location and size of refineries in Europe. P. H. Frankel and Walter L. Newton (*Petroleum Economics Ltd*).

* * *

Exhibitions and Conferences

Top Industrialists attend Management Seminar

Among the delegates was N. M. E. Proes, head of efficiency research, Shell Petroleum Co. Ltd (second from left), seen talking with J. Masterton, director Joseph Lucas Ltd, Roy Harrod, the well-known economist, and E. Bealing, managing director, Sandvik Steel Band Conveyors Ltd

A seminar for senior management held at the Welcombe Hotel, Stratford-on-Avon, by Mead Carney & Co. Ltd, management consultants, on 8 October, was attended by over 90 delegates. The subject discussed was "The Implications for British Management of Today's Tightening Squeeze on Profits", and the large audience heard four distinguished speakers during the day.

World Power Conference Meetings

About 1300 delegates and others from 51 countries attended the Sectional Meeting of the World Power Conference held at Montreal from 7–11 September.

Sessions of the International Executive Council of the World Power Conference were held in Montreal on 6 and 10 September.

Three new member-countries were elected: Peru, the Federation of Rhodesia & Nyasaland, and Uganda, increasing the membership of the World Power Conference to fifty-three. An application for membership from Nigeria will be considered. It was decided to postpone consideration of applications for admission to the Conference which had been received from the People's Republic of China (Peking) and from the Republic of China (Formosa). The next Sectional Meeting will be held in Madrid, the dates tentatively selected being 5–9 June 1960, and the Sixth (Plenary) World Power Conference is to take place in Melbourne in October 1962. The British National Committee of the Conference have published the WPC 1958 list of *National Committees and Representatives*, which is obtainable from the World Power Conference, 201/2 Grand Buildings, Trafalgar Square, London, W.C.2.

International Road Federation Meeting

The Third World Meeting of the International Road Federation was held in Mexico City from the 26 to 31 October 1958. Previous World Meetings have been held in Washington (1952) and in Rome (1955).

Delegates and observers from some 60 countries attended, including representatives from the following international organizations: United Nations, International Labour Office, European Conference of Ministers of Transport, International Bank for Reconstruction and Development, and the International Chamber of Commerce.

At the opening assembly on 26 October delegates were welcomed by the President of Mexico, His Excellency Adolfo Ruiz Cortines.

Speakers included: H. S. Merriman, chairman IRF Washington Office, Baron de Wouters, president IRF Paris Office, and C. T. Brunner, vice-chairman IRF London Office, the joint-hosts for the meeting.

Mr Brunner, vice-chairman of the British Road Federation and a director of Shell-Mex and B.P. Ltd also headed the BRF delegation.

On 27 October C. B. Nixon (a past president of the Society of Motor Manufacturers and Traders) spoke at the session on the economic advantages to be gained from developing road systems capable of allowing modern goods and passenger vehicles to operate to the maximum of their efficiency.

M. Georges Gallienne (former president of the IRF Paris Office and president of the French Road Federation) led the discussions on road financing on 28 October.

The discussion on the technical training of highway engineers took place on 29 October, with H. S. Merriman, chairman of the IRF Washington Office, in the chair.

Delegates visited the El Olivar Operators and Mechanics Training Centre, the New University of Mexico, and a number of outstanding road works, on 30 October, and at the closing session on 31 October, a highway seminar was held.

In the course of his address, C. T. Brunner said that every Government should provide an adequate basic network of communications. But modern roads, like other forms of modern transportation, require considerable capital.

In developed countries it would always be a case of offering economic justification for the priority of road schemes. In under-developed countries, while the justification might well be economic in very many cases, there could, also, be strong social grounds for building roads.

Standard solutions to the highway problems of different countries were improbable, and therefore national road associations must clearly be concerned with the detail and local circumstance of highway matters.

Comparison with other countries could be a useful move provided the examples were reasonably chosen, said Mr Brunner. To point to the success of one urban motorway was no justification for all urban motorways. They must not be dazzled by the spectacular achievement, the great international highway, whose obvious success was rightly a matter of national pride. Good roads were basically important because their efficiency was the complement to economic efficiency. Many essential projects would not encourage votes and Governments might need the strong inducement of irrefutable fact.

It was in these things that national road associations looked to the International Road Federation.

Around the Branches

BAHRAIN, ESSEX, FAWLEY, KUWAIT, LONDON, NORTHERN, SCOTTISH, SOUTH-EASTERN, SOUTH WALES, STANLOW, TRINIDAD, YORKSHIRE

Scottish Branch

The IP Scottish Branch held its inaugural meeting of the 1958/59 session in the North British Hotel, Edinburgh, on 16 October, Dr G. H. Smith, M.C., occupying the chair. The speaker was Geoffrey Pratt, who gave a talk on the Trans-Antarctic Expedition.

The chairman in introducing the speaker, said that Mr Pratt had joined the British Petroleum Company as a geophysicist in 1950, and had since travelled widely in the Middle East, Far East, and Canada in search of oil. In 1956 he was seconded to the Trans-Antarctic Expedition, as seismologist.

He gave a most interesting description of the epic journey, the setting up of the camp, and the work that was done on the Expedition. This was illustrated by numerous coloured slides, and followed by a lengthy period of questions.

Stanlow Branch

A joint meeting was held with the North Lancashire Section of the Royal Institute of Chemistry on 26 September at Grosvenor Hotel, Morecambe. The Chair was taken by C. D. Lafferty, chairman, North Lancashire Section, RIC, who introduced D. H. Desty, British Petroleum Co., who gave a lecture on "Gas Chromatography".

After outlining the particular applicability of this analytical tool to problems encountered in the petroleum industry, the speaker briefly described the more usual types of apparatus. Analytical results obtained by gas chromatography, mass spectrometry, and low-temperature fractionation were compared. The sensitivity obtainable by gas chromatography was well illustrated by results obtained on the examination of engine test grade iso-octane, where small amounts of impurities, undetectable by other means, could be recognized.

Variations in the nature of the separation obtainable, resulting from changes in the relative retention volume with alteration of the stationary phase in the column were explained. The speaker concluded by mentioning the latest developments, such as columns of extremely high separating efficiency and the suitability of the hydrogen flame detector for high temperature analyses.

The discussion was opened by C. G. Scott, Lobitos Oilfields Ltd, and participated in by several speakers.

The vote of thanks was proposed by J. A. Dukes (RIC).

South Wales Branch

On 9 October the South Wales Branch was honoured with a visit by the president of the Institute, C. M. Vignoles, C.B.E., managing director, Shell-Mex and B.P. Ltd. The large audience included several friends from the Institute of Fuel and a number of visitors.

Mr Vignoles, after expressing his pleasure on coming to Llandarcy, introduced his talk "The Inter-relationship of Fuel Supplies", which he said had particular relevance to South Wales, an area traditionally a supplier of coal. Coal is still of great importance but with our economy based on a wider range of industry a new fuel—oil— was coming more and more to the fore. This advance in oil fuel consumption posed an adjustment both mental and physical in order that the most efficient use be made of it.

In 1938 the total inland consumption of oil was 9 million tons of which one-sixth was diesel and fuel oil. In 1958 the consumption is at a rate of 28½-million tons, of which a half is diesel and fuel oil.

There has been a marked preferential upsurge in oil fuel use resulting in a changed pattern in fuel supplies. Advances have been made in steam raising, especially in the generation of electric power, where it is expected that 2½-million tons per annum will be used.

Another expanding market is for domestic fuel, where oil is very competitive with other fuels for space heating. Also there is the field of direct industrial application, where oil fuel is making great strides in the steel, glass, pottery, and bakery industries.

Mr Vignoles mentioned two factors influencing the rapid growth in the use of oil fuel:—

(1) The increase in efficiency through the oil companies giving expert help and guidance with design of plant and oil burning facilities.

(2) Its contribution to the clean air problem.

Turning to rail traction, he said the diesel and diesel/electric system showed overwhelming advantages over coal.

It was estimated that the consumption of oil would by 1975 be half as much again as at present. Industry, being competitive, must have access to the cheapest and most suitable type of fuel. It must have freedom of choice, and in an expanding future there was room for all types of fuel.

Following on an interesting discussion, Mr Patrickson, works manager, BP Refinery (Llandarcy) Ltd, proposed the vote of thanks which was enthusiastically applauded.

Yorkshire Branch

The tentative committee of this new Branch are proceeding well with their preliminary arrangements. The first Annual General Meeting will be held at the Queens Hotel, Leeds, on Thursday 15 January 1959, at 7 p.m. and will be addressed by the president of the Institute—C. M. Vignoles, C.B.E. All members, intending members, and any one else interested will be most welcome.

The Gas Council's Annual Report

The Gas Council has issued its Ninth Annual Report and Accounts for the financial year ended 31 March 1958. The most outstanding feature of the year under review is the progress which has been made in the practical development of new processes and sources for the supply of gas. Regarding the future pattern of gas supply the Council are studying the possibility of a national grid system, which would be supplied from various gas-making sources, as a long-term project.

Research

As a result of research carried out at the Council's Midland Research Station, a full-scale plant for further experiments in the manufacture of gas by the hydrogenation of coal or oil at high pressure is being constructed at the Partington works of the North Western Gas Board, near Manchester. The plant will have an initial capacity of 7½ million and an ultimate capacity of 15 million, cubic feet of gas a day.

Another application of research on the hydrogenation process, is the planned construction by the South Western Gas Board, of a plant for the hydrogenation of light petroleum distillates at Bristol, where a production of 5 million cubic feet of gas a day will be attained.

Gasification of Oil

The first stage of the largest project for the gasification of oil, a new works being constructed by the South Eastern Gas Board adjacent to the Isle of Grain refinery, Kent, should be in operation during the autumn. This initial phase will have a capacity of 20 million cubic feet of gas a day, and will use the catalytic *Segas* process, developed by the South Eastern Gas Board. For the later stages, when capacity will be raised to 60 million cubic feet a day, a new process, developed by the Royal Dutch/Shell in their research laboratories in Amsterdam, will be used. This latter process consists of a partial combustion of oil with oxygen and steam under a pressure of 300 lb per square inch. The resultant gas will be of relatively low calorific value but high in hydrogen and will be mixed with the high calorific gas from the *Segas* plant to provide the normal town's gas supply of 500 Btu to the cubic foot.

At the end of the year 25 oil gasification plants were in operation, 11 new installations having come into commission during the year. Fourteen other plants were under construction or on order, and when these are completed the total capacity of all oil gasification plants will be 120 million cubic feet a day, the consumption of oil being of the order of 400,000 tons a year.

The quantities of oil used and the amount of gas made from these during the last two years can be seen in the table below.

	Gas oil or diesel oil used	*Heavy oil used*	*Total of oil used*	*Oil gas made*
	tons	tons	tons	therms
1956/57 ...	3,800*	19,300	23,100	5,326,000
1957/58 ...	5,800†	59,900	65,700	16,231,000

* Includes 3,700 tons of light oil distillate.
† Includes 4,500 tons of light oil distillate.

Gas from Oil Refineries

In addition to the agreements concluded between the gas authorities and the Shell Petroleum and Esso Petroleum companies for substantial supplies of gas from the refineries at Shell Haven and Fawley respectively, mentioned in previous Reports, the North Thames Board has now also made an agreement with the Mobil Oil Company Ltd. The Company is to supply 12 million therms of gas a year from Coryton refinery. The Coryton gas and also that from Shell Haven will be piped for reforming at the Romford works, and the first of the four units of the plant for reforming the gas was completed soon after the end of the year under review.

When the arrangements with the three oil companies for gas from the refineries are in full operation, the yearly supplies will be equivalent to the gas produced from half a million tons of carbonization coal.

Importation of Liquefied Natural Gas

As has been mentioned in the previous report, a project was envisaged for the experimental importation by sea into Britain of liquefied natural gas. During the year under review a contract was signed to this effect,and the first supplies were planned to come from the Gulf Coast of the U.S.A. A cargo ship was to be converted in the United States to carry about 2000 tons of liquid natural gas, reduced at a temperature of 260° F to one-six-hundredth of the space it would occupy in gaseous form.

Since the publishing of the Gas Council Report it has been announced that the ship in question, the *Methane Pioneer*, is now fully converted and is about to undergo trials lasting about three months. At the end of this period she will sail for the U.K. with the first experimental cargo.

The Search for Natural Gas

The search for natural gas continued during the year, but on a reduced scale, as the results of previous work and future prospects were being reassessed. No major discoveries have been made, but the potentialities of several smaller anticlines are being investigated. A well at Cousland in Midlothian has been reopened and the Scottish Gas Board has been taking a regular supply of natural gas to its works at Musselburgh from whence it is distributed as part of their town's supply.

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Pipeline for London Airport

Plans are being made to supply aviation fuel to London Airport by pipeline.

Shell-Mex and B.P. Ltd intend to seek the sanction of Parliament to a Private Bill which, if allowed, will permit the construction of a pipeline to carry the fuel from storage at Walton-on-Thames.

The pipeline is made necessary by the advent of the jet age in civil aviation coupled with the increasing expansion of air traffic, and would provide the most speedy and reliable method of supplying the airport.

Personal Notes

It is with great regret that we announce the death of **Dr Richard Allan Bramkamp** at the early age of 48, on 1 September 1958. It deprives the Middle East oil industry of one of its outstanding geologists, and his many friends of a personality both loved and respected.

Born at Richmond, Indiana, on 5 February 1910, Dr Bramkamp was educated in California, graduating at Pomona College, and taking his doctorate in 1934 from the University of California at Berkeley.

After two years at the University Museum of Palaeontology, he entered the oil industry as a palaeontologist with the Standard Oil Company of California, and was assigned in 1936 to service with Aramco in Saudi Arabia, where he worked for the rest of his career.

In 1944 Dr Bramkamp became senior palaeontologist and three years later he was promoted successively to the posts of chief field geologist and chief geologist.

In these rôles, he played a leading part in the remarkably successful programme of oil exploration and development which has given Aramco its high position amongst the world's major producers.

Notable alike for his practical shrewdness and unassuming diplomacy, Dr Bramkamp was also a dedicated geologist whose important contributions to the scientific literature of Arabia will remain as a fitting memorial to him.

In 1956, Dr Bramkamp married Mrs Crystal Warder who survives him.

Our sincere condolences are extended to his widow, and to his parents. *Geological Department, Iraq Petroleum Company.*

L. W. Farrow

Leslie W. Farrow, chairman since 1943 of C. C. Wakefield & Co. Ltd, celebrated his seventieth birthday on 7 October.

He was a prize scholar at Alleyn's School, Dulwich, and later studied at The London School of Economics. He passed his C.A. Finals with Honours, and won the W. B. Peat Gold Medal and Prize and other distinctive awards.

In 1906 he was articled to a leading firm of accountants, and by the end of World War I he was senior partner at the age of 30.

Mr Farrow was elected to the City Corporation in January 1924, and served as a Common Councillor for fifteen years. He has taken part in the government of his profession and has been a member of the Council of the Institute of Chartered Accountants since 1932. During the 1914–1918 War, he was a member of the London Ambulance Column attached to the War Office, and then Director of Finance, Explosives Department of the Ministry of Munitions, from 1917–1919. He has also served during the recent war as Deputy Paper Controller (1939), as Director for Commercial Relations of Ministry of Supply (1942), as chairman of the National Brick Advisory Council, Ministry of Works (1942), and, as early as 1938, became a member of the Bacon Development Board, Ministry of Agriculture.

The presentation to M. Maillocheau

On his retirement from the position of managing director of Societe Anonyme des Huiles Castrol (Castrol's French associate company) **M. Jean Maillocheau** (on left in photograph) flew to London to be presented with a gold watch by Leonard Broadway, deputy chairman and managing director of C. C. Wakefield & Co. Ltd on 16 October.

Born in Nantes in 1897, M. Maillocheau joined the Castrol sales staff in Paris in 1923 and has been managing director there for 28 years. His place has been taken by **M. Albert Baudart,** formerly assistant managing director.

Norman Hardy, president of the Arabian American Oil Co., has been designated chief executive officer. Fred A. Davies will continue as board chairman.

It was also announced that seven Aramco vice-presidents have been elected to the board of directors in a move to bring field management into greater participation in board affairs. They are **P. H. Arnot, T. C. Barger, R. I. Brougham, R. A. Eeds, R. S. Hatch, J. H. McDonald,** and **L. M. Snyder.** With the exception of Mr McDonald the new directors, as well as Mr Davies and Mr Hardy, reside in Dhahran, Saudi Arabia, headquarters of Aramco's producing and refining operations.

The Aramco board as now constituted includes, in addition to the nine from Aramco, representatives of the four owner companies—Harvey Cash, The Texas Company; H. W. Page, Standard Oil Company (New Jersey); G. L. Parkhurst, Standard Oil Company of California; and Robert Siegel, Socony Mobil Oil Company, Inc.

Peter Clark, B.Sc., Eng.A.R.S.M., has joined Metal and Pipeline Endurance Ltd (MAPEL) as a senior corrosion engineer. Mr Clark attended the Royal School of Mines, London, obtaining an honours degree and diploma in metallurgy and for the past eight years has had experience with the British Petroleum Company on corrosion engineering in Persia, Kuwait, and Aden.

H. E. Cooper has been appointed managing director of G. A. Harvey & Co. (London) Ltd. Mr Cooper, first appointed to the Board in 1946, has been acting as deputy managing director since May of this year.

I. A. Marriott succeeds P. T. Bliss as sales director. Mr Bliss, who has been with the Company for 50 years, retires on 31 December.

Alec M. Hughes, M.A., general secretary of The Scientific Film Association, has taken up the post of visual aids officer of the British Association for the Advancement of Science.

Mr Hughes was appointed general secretary of SFA in February 1956, having for the previous seven years been deputy warden and senior lecturer at Burton Manor Residential College for Adult Education.

National Benzole Co. announce the retirement of **G. E. Roberts,** manager of the Company's Eastern Division.

Mr Roberts has been succeeded by **W. S. Westbrook,** who has been assistant manager of the National Benzole's Eastern Division since 1949.

Mr Roberts was educated at Bradford Grammar School and joined the National Benzole Company in 1922 as a representative in the Manchester Division. In 1923 he was appointed divisional manager, Liverpool and North Wales Division and in 1930 he was transferred to the Bristol Division as manager.

He became manager of the Eastern Division in 1933.

W. S. Westbrook was born in London in 1911 and educated at Palmers School, Grays, Essex. After serving in the Royal Air Force from 1929 to 1932 he was employed in his father's yacht business.

He joined the National Benzole Company as representative, Southend Area, in 1935. After demobilization in 1945, he was seconded to the Petroleum Board as assistant district operator and he rejoined the National Benzole Company in 1948, being appointed assistant divisional manager the following year.

D. Flynn, at present district manager in the London Division, becomes assistant divisional manager, Eastern Division.

The National Benzole Co. also announce the following further appointments:—

J. G. Wilson, formerly a district manager, Midland Division, has been appointed assistant divisional manager, South Wales Division.

T. A. Sharpless, formerly retail marketing representative, Lancashire Division, has been appointed district manager, Midland Division.

D. H. Lawton, formerly retail marketing representative, Bristol Division, has been appointed a district manager in the London Division.

H. A. Rich

H. A. Rich, division manager of Mobil Oil Company's North Midland Retail Division in Sheffield, recently celebrated his 30th anniversary with the Company. To mark this achievement, his colleagues presented him with a picnic set complete with table, chairs, and luncheon basket.

Mr Rich, who was born in Leeds, joined Mobil in 1928 at the age of 16. For three years he worked in the Bradford Office before moving to Sheffield. He became a salesman on the North Lincolnshire territory in 1937 and continued to hold this post until the outbreak of war. After the war, Mr Rich returned to Lincolnshire and remained there until 1956 when he was appointed district manager in the newly formed South Midland Automotive Division with headquarters in Birmingham. He was appointed to his present post in November, 1957.

A. N. Wiggett (left) managing director of Alexander Kenyon and Co. Ltd, pictured with **C. S. Martin,** divisional manager North-west Division, Shell-Mex and B.P. Ltd, at the recent official opening of Akenco House, Elizabeth Street, Manchester 8, Kenyon's new headquarters.

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Middle East Oil Production

	September	*Jan.–September*
		Tons
Iraq Petroleum Co. Ltd ...	2,079,689	16,338,244
Basrah Petroleum Co. Ltd ...	971,009	7,946,635
Mosul Petroleum Co. Ltd ...	109,914	969,766
Qatar Petroleum Co. Ltd ...	663,579	5,979,127
Iraanse Aardolie Exploratie en Productie Mij	3,602,000	29,846,000
Kuwait Oil Co. Ltd	5,844,188	50,713,551
		Barrels
Arabian American Oil Co. (Saudi Arabia)	32,399,290	274,976,644
Bahrain Petroleum Co. Ltd ...	1,298,615	11,705,629

Kirkuk oilfield recently produced its 200 millionth ton of crude oil. Only three other oilfields in the world—in Texas, Venezuela, and Kuwait respectively, had previously attained this level of output.

The refinery throughput at Abadan of the Iraanse Aardolie Raffinage Mij for September was 1,289,000 tons, the total for 1 January to 30 September being 11,426,000 tons.

Crude processed at Aramco's Ras Tanura refinery during September amounted to 4,988,528 brl, the total for 1 January to 30 September being 46,819,805 brl.

Oil deliveries from Sidon, Lebanon, by Trans-Arabian Pipe Line Co. in September were 13,486,621 brl, the total for 1 January to 30 September being 100,850,113 brl. The average Sidon deliveries of 449,554 brl per calendar day in September, is a new record for the Tapline. The previous highest was an average of 394,367 brl per calendar day during October, 1957.

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CORRESPONDENCE

PLATFORMING

To the Editor, the *IP Review*.

Sir,

May I call your attention to an error which occurred in the September 1958 issue of the *IP Review* in the article headed "Foundation Pile Driven at Esso's Rotterdam Refinery". I refer to the comparison made between the reforming installation at that location and "previous platformers".

The name Platforming is a trade name belonging to Universal Oil Products Company, U.S.A., and its use is limited to units of this widely adopted process, and to the selective, stable platinum containing catalysts supplied by Universal-Matthey Products, Ltd, of London, and by U.O.P. for use in this connexion.

Although in certain instances the name of Platforming has been erroneously used to refer to processes other than those licensed by Universal, we have hastened to request correction of such error. It is hoped that this letter can be given the same publicity as the original article and that no misconstruction has been put on the article as printed through the erroneous use of our trade name.

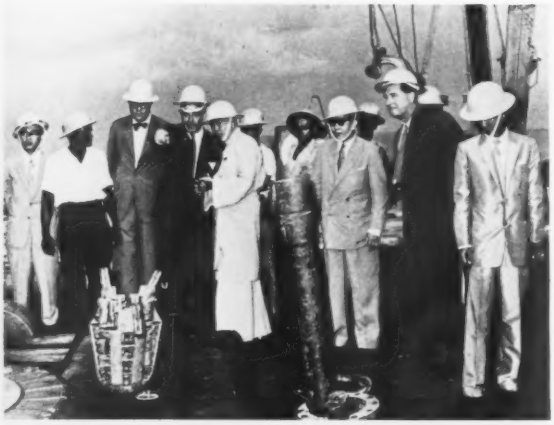
Yours faithfully,

F. A. Trim,
Representative,
Universal Oil Products Company.

Bush House,
London,
1 November 1958.

Notes of the Month

Malayan Rulers Visit Seria Oilfield



The Hon D. C. White, O.B.E., British Resident, Brunei, points out features of the drilling platform at Well 494, *Seria to H.H. The Sultan of Selangor and H.H. The Regent of Negri Sembilan. On Mr White's right is R. E. Hales, C.B.E., managing director of Brunei Shell Petroleum Co.*

Three Malayan Rulers and other dignitaries visited Seria Oilfield on 24 September at the invitation of Brunei Shell Petroleum Company Ltd. This was one of the first events in a week of official celebrations culminating in the ceremonial opening of the million-pound Omar Ali Saifuddin Mosque in Brunei Town by H.H. the Sultan of Brunei.

Two Prince aircraft of Brunei Shell's fleet, with R. E. Hales, C.B.E. (chairman and managing director) and P. M. Linton (technical manager) accompanying the visitors, flew from Brunei Town early in the day to Anduki, Shell's own airfield adjoining Seria. Before landing, the aircraft were flown over the 15 square mile oilfield—one of the largest in the British Commonwealth—and circled a marine drilling platform close offshore, from which up to 12 wells are being drilled in the sea bed.

At Anduki, Government and Company officials were presented, and a car tour began. The gss processing plant, the large workshops and stores complex, some of the housing erected for the Company's multi-racial community, and the trades school were each visited.

The tour continued with a visit to a land drilling well—the 494th well to be worked at Seria since the field was discovered in 1929. It was being drilled to tap the oil-sand expected at a depth of 7800 feet, and deviated nearly 2000 feet from the vertical under the sea bed. Over 300 wells are producing at Seria at present, and production in 1957 was 5½ million tons (41 million barrels).

The party consisted of: H.H. The Sultan of Selangor, H.H. The Sultan of Pahang, H.H. The Raja of Perlis, H.H. The Regent of Negri Sembilan, Tunku Mahmud Iskandar, son of H.H. Regent of Johore, Dato Abdul Hamid bin Haji Jumat, Deputy Chief Minister, Singapore, and Hon D. C. White, O.B.E., British Resident, Brunei.

BP Agreement with Sinclair

The British Petroleum Co. Ltd, and Sinclair Oil Corporation announce that they have agreed in principle to develop a programme covering the following areas of activity, which they have found to be of mutual interest:

A long-term supply agreement covering Sinclair's U.S. domestic requirements for Middle East crudes produced by British Petroleum in the Persian Gulf area.

The establishment of a jointly owned company to engage primarily in the marketing of Middle East and Venezuelan crudes in the Western Hemisphere.

The establishment of a jointly owned company to provide for exploration and production ventures, primarily in Latin America.

The joint programme has been under study for some time, and has been evolved as being particularly well fitted to the two Companies' positions, which are in many ways complementary. British Petroleum is one of the largest producers and marketers of petroleum and petroleum products in the Eastern Hemisphere. On the other hand, Sinclair is a substantial producer and marketer in the Western Hemisphere.

Shell to Join Australian Oil Search

An advanced stage has been reached in negotiations whereby a Royal Dutch/Shell Company would acquire an interest equal to each of those of California Asiatic Oil Company and Texaco Overseas Petroleum Company in the oil exploration activities of West Australian Petroleum Pty Ltd.

West Australian Petroleum Pty Ltd holds exploration permits over nearly 300,000 square miles in Western Australia and the venture has already cost more than £A14,000,000.

A re-adjustment of interests will be necessary to accommodate Shell. However, relative to each other, the proportionate interests of California Asiatic Oil Company, Texaco Overseas Petroleum Company and Ampol Exploration Ltd in the venture will not be affected: Ampolex will hold one-seventh and the others two-sevenths each.

New Off-Shore Bunkering Facilities

A major construction scheme to provide off-shore oil bunkering facilities for world shipping is now nearing completion at Freeport on the Grand Bahama Island; it will be in operation early in 1959.

This scheme developed by the Freeport Bunkering Company Ltd, under licence from the Grand Bahama Port Authority, will provide off-shore bunkering facilities for all types of shipping in relatively protected waters with a minimum depth of 45 feet.

The facilities which will be available include an eighteen inch submarine Bunker "C" pipeline pumping 1000 tons an hour, an eight-inch diesel (light and heavy) pipeline, and a laboratory staffed with trained personnel to ensure uniformity of supply and to blend fuels to the specific needs of any ship.

The scheme has been designed and carried out by the Ralph M. Parsons Company of 617 South Olive Street, Los Angeles 14, U.S.A. and provision has been made for the storage of 100,000 tons of petroleum products.

Nigerian Oil Search

Two new oil successes in the Eastern Region of Nigeria, are announced by Shell-BP.

Exploration wells have struck oil at Ebubu, in Ogoni Division, ten miles due east of Port Harcourt, and at Krakrama, in Degema Division, fifteen miles south-west of Port Harcourt. Further tests, however, will be necessary to determine the significance of these new discoveries.

Drilling began on the two wells a little over two months ago and both were taken to depths approaching 12,000 feet. The Krakrama well, which is located in the heart of the Delta swamps, is the second to be drilled from the Company's drilling barge, the next location for which will be at Ekulama, also in the Delta, fifteen miles west of Krakrama. The rig from Ebubu will now drill a new exploration well at Miriegbe, thirty miles east of Port Harcourt.

A Shell-BP exploration well at Ethiope in the Delta Province, Western Region of Nigeria—the deepest so far drilled in the country—has been abandoned as a dry hole after reaching a depth of 13,100 feet.

The rig which was used at Ethiope, Shell-BP's third exploration well in the Western Region, will now be moved to Ubulu Uku in the Benin Province where a new exploration well is to be started.

A show of oil has been encountered in an exploration well at Uquo, in Eket Division, Calabar Province, 70 miles east of Port Harcourt, which reached a total depth of 10,350 feet Further testing is in progress to assess the commercial significance of the find.

BP Aids Technical Education

With the start of the new academic year The British Petroleum Company has a record number of students attending British universities and technical colleges under its various training schemes. The Company is thereby making an important contribution to the request made in the Ministry of Education's recently issued pamphlet appealing to industry for co-operation to improve the nation's technical education.

At present the group has 160 university apprentices attending scientific and technical courses at various U.K. universities, with their fees paid and a salary provided. During vacations they receive practical experience in the group's refineries and oilfields, both at home and overseas. It also has 70 student apprentices being trained for professional qualifications in chemistry and engineering. These young men study on a "sandwich" basis, alternating periods of full-time academic study with periods of full-time practical training on the job. Vacation training courses are also run for students who are not members of the BP organization. University and technical college tutors are invited to participate in these courses as instructors, thus enabling them to obtain first hand knowledge of industrial working conditions.

The Company also gives financial assistance to universities and colleges by financial donations. It is at present contributing to the new Churchill College, Cambridge, St. Catherine's College, Oxford, the College of Science and Technology, Manchester, and to various funds of the universities of Birmingham, Durham, Edinburgh, London, and Wales. To encourage research the Company makes studentship grants for periods of three years each to a number of university professors which enable them to employ postgraduate students in research work. In some cases scientists of the Company staff are also seconded to universities for research tasks.

Gas Compressor Plant for Kuwait

In mid-1959 Kuwait Oil Company plan to put into operation what will ultimately be one of the largest gas compression plants in the Middle East.

The compressors, which will be driven by gas turbines, will compress gas to a high pressure so that it can be injected into the underground oil-bearing formation. This will reduce the amount of surplus gas which is now burnt at the field flares.

The compressor station will be situated in the middle of the Burgan field. Its construction and the installation of the equipment will be largely carried out by local contractors. The first stage of development of the plant will comprise the setting to work of two compressors, each driven by a gas combustion turbine of 7000 hp. The total volume of gas which will be compressed and injected will be about 100 million cu. ft. per day.

Once the plant has been started up, it will control itself automatically and will shut itself down in case of any failure of the controls or other accident.

After sufficient experience has been gained of the effect of operation of the first plant, it is planned to commission a second plant of equal capacity.

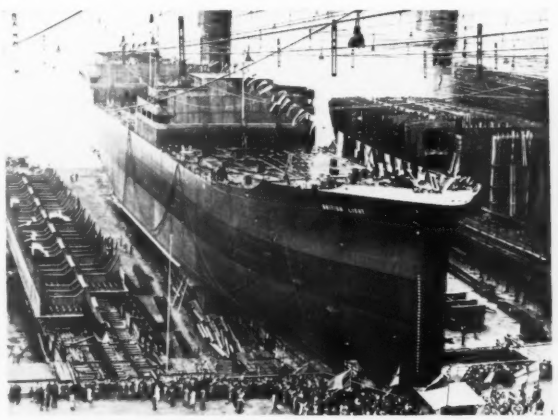
Somaliland Survey

BP Exploration Company is shortly to resume its geological survey work in British Somaliland. The licence area covers nearly 6000 square miles of the coastal strip between Berbera and the north-western border. Previous geological surveys in the area were carried out by the Company in 1956-57.

Tanker Launching at Genoa

The first tanker to be built for the BP Tanker Company by the Italian shipyard Ansaldo S.p.A. was launched at Genoa on 12 October. The new 35,000 dw ton vessel was named *British Light* by Signora Mattei, wife of the President of ENI the Italian oil organisation.

British Light is the second of six tankers of similar size and design ordered by BP from Italian yards in 1955. The first, *British Star*, was launched at the Trieste shipyard of Cantieri Riuniti Dell 'Adriatico in June. Ansaldo and CRDA are each to build two further tankers for BP, which are due to be launched next year.



View of British Light *prior to the launch*

Changes in BP's Refineries Organization

As a result of the increase in the scope and work of BP's Refineries and Technical Department, changes in organization and appointments have taken place.

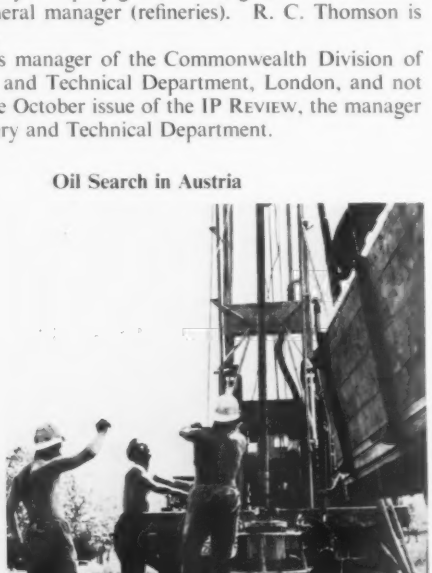
J. Moffat has been appointed deputy general manager (Refineries), with responsibility for manufacturing operations, and the planning of overall refinery programmes, throughout the BP Group. Dr T. Tait becomes manager, Refineries Division—a post which will cover the work of the present area divisions (to be re-named UK Refinery Group, Continental Refinery Group, etc.) and of Production Control Branch.

J. W. Hyde has been appointed assistant co-ordinator (research) and W. J. Newby, assistant co-ordinator (development) under the co-ordinator, research and development, P. Docksey.

M. A. L. Banks is general manager of Refineries and Technical Department and is also a director of BP Trading Ltd. S. W. Adey is deputy general manager, with Mr Moffat as deputy general manager (refineries). R. C. Thomson is chief engineer.

H. L. Ray is manager of the Commonwealth Division of BP's Refinery and Technical Department, London, and not as stated in the October issue of the IP REVIEW, the manager of BP's Refinery and Technical Department.

Oil Search in Austria



Drilling a shot hole during a seismic survey near Schibbs

In an effort to reverse the present decline in Austrian crude oil production, several oil companies, among them The British Petroleum Co., are now prospecting for new oil reserves there. BP is doing so through a joint venture with the O.M.V., the State Oil Administration.

Agreement on the formation of this venture, known as the Arbeitsgemeinschaft OMV/BP was reached in 1957 and after preliminary geological studies, a seismic survey in the Scheibbs area in Lower Austria was begun in 1958. The survey is being carried out by a contract party and is expected to last six months.

The joint venture covers at present only the two small concessions of Scheibbs and Amstetten—a total area of about 2000 sq. km, but the agreement provides for extension to other areas if these become available.

Calouste Gulbenkian Foundation

The Board of Trustees of the Calouste Gulbenkian Foundation, Lisbon, recently announced this year's list of grants which amount in all to nearly £1 million. Out of these the British Isles and the Commonwealth overseas receive over £200,000. Half of the British grants are in the field of the arts, such as the £42,000 towards the restoration of the Old Bodleian Library, Oxford.

Another grant of special interest is the £50,000 to endow three Gulbenkian studentships to Churchill College, University of Cambridge, for graduates of universities outside the U.K.

South Wales Pipeline

Construction work has started on what will be Britain's longest crude oil pipeline when it is completed by the end of next year. The pipeline will run for nearly 60 miles across South Wales, linking BP's new deep-water tanker terminal now being built at Milford Haven to the BP Llandarcy refinery, and will have an annual capacity of five million tons.

Site work has begun at the Llandarcy refinery end and initially is being concentrated on the more difficult sections, where the pipeline will cross roads, rivers, and railways. Next spring, work will start on the main run of the line which will be laid at the rate of two miles a week.

High Altitude Test Plant

J. D. Pearson, chief executive and deputy chairman of Rolls-Royce, at the recent opening of a new aero-engine high altitude test plant, revealed that Rolls-Royce stockholders have, over a period of seven years, subscribed more than £22 million in cash for engine test facilities, and have permitted the retention of an almost equal amount to provide the company with the required facilities. The new plant alone cost £5,800,000 and, after further installations, will have cost nearly £7 million.

The plant, which was opened by the U.K. Prime Minister, covers an area of more than 12 acres is the only privately owned establishment of its type outside the U.S., and is the latest addition to Rolls-Royce's research and development facilities which are worth some £75 million.

The new plant is capable of testing turbojet and turboprop engines at heights of up to 70,000 feet (more than 21,000 m.) and at two and a half times the speed of sound.

The decision to build this plant was taken in 1954 and design work started at once. The first test run of the equipment took place at the end of 1957, and the first run with an engine in the test cell was in April this year. More than 200 hours of engine testing has already been undertaken and it is hoped to achieve 2000 hours of testing a year within a short time.

Another privately-owned high altitude test chamber of a rather different type has been in use at Vickers-Armstrongs' works at Weybridge for some time.

Capable of simulating conditions "over twice the height of Everest and colder than the Poles", the main cylinder is 25 feet in diameter and 50 feet long and is enveloped by a "house of thermal insulation". The use of this installation is available to other industries and to Government departments for research and testing when controlled extremes of temperature and low pressures are required.

KEY FIBRE PIPE PRODUCTION

The first recorded pitch fibre pipe installation was in 1856 when it was employed for gas supply in Germany (and found still in good condition when dug up some 50 years later). At the turn of the century its use rapidly spread, and in 1903 American pipe began to be imported into Great Britain. During the following years many thousands of miles were installed for major electrical undertakings throughout the country. In addition to the conduit application, pitch fibre drainpipes were being laid, and samples of these pipes have since been disinterred and proved to be in good condition.

It was not until 1954 that the first British-made fibre pipe was introduced, by the Key Engineering Co. Ltd which had been the Empire agents for American fibre pipe since its introduction to Great Britain. However, the immense market that was opening up both at home and overseas and the shortage of dollars during the recent post-war period, prompted the company to approach the Reed Paper Group with the aim of developing the production of fibre pipe in this country.

A factory was completed in 1954 at the Group's headquarters at Larkfield, near Maidstone, Kent, and plant was put on a production basis in that year. There was at that time no British Standard Specification for pitch fibre pipe, but the material produced was manufactured on the basis of American specifications. The Key Engineering Company subsequently became a member of the Reed Paper Group, and as the superior quality of the British product became recognized in the building industry, it became clear that existing output would be insufficient to meet requirements.

It was decided not only to carry out extensions to the Larkfield factory, but also to develop a completely new design of high-capacity, special-purpose production equipment. The result has been what can be claimed to be the most up-to-date plant in the world producing pitch fibre pipe.

Wherever possible, automatic processes have been installed to ensure the economic production of pipe to consistently fine limits. Key fibre pipe carries the British Standards Institution "Kite" Mark (British Standard 2760: 1956), and is indeed so far the only fibre pipe licensed to bear this certification.

The use of this material has been pioneered throughout the Empire by the Key Engineering Company and their pipes are now being exported to over thirty countries including Africa, South America, and the Middle and Far East. Key fibre pipe has also proved itself as a material dollar earner in American construction schemes being carried out in Europe and the Middle East.

The three basic uses for the pipe are drainage, conduits, and underfloor duct wiring systems.

It is claimed they are particularly favourable for use in drainage, owing to the fact that they can be installed almost regardless of weather conditions, by unskilled labour, and that the pipe gives a leak-proof self-sealing joint which renders concrete beds unnecessary. In addition the pipe can if necessary be cut easily with an ordinary hand-saw.

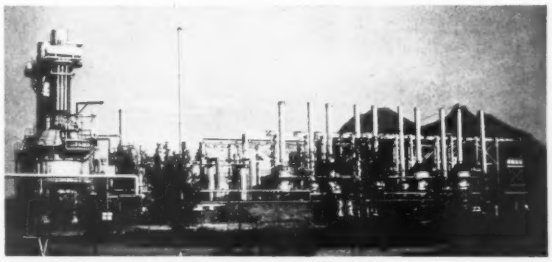
For use in electrical installations Key fibre pipe is said to be economical, leak-proof, and non-corrosive, having been used on major civil engineering works and building construction for more than fifty years. Other installations have included chemical works and oil refineries.

The use of fibre pipe in underfloor wiring systems came into this country from the U.S.A. in about 1930 and the scheme is based on a grid of ducts, which can be single, double, or triple, laid to cover the entire floor of a building. These ducts can be tapped at any point along their length.

In all these uses, one of the major customers for Key fibre pipe has been the petroleum industry.

Kellogg Appointed Sales Agent for Mexican Sponge Iron Process

Kellogg International Corporation announced that its parent company, The M.W. Kellogg Company of New York, has been appointed exclusive sales and licensing agent for a new process for the production of sponge iron from iron ore using hydrocarbons, by Fierro Esponja, S.A. of Monterrey, Mexico, an affiliate of Hojalata Y Lamina, S.A., one of Mexico's principal steel producers. Theoretically possible for many years, the production of sponge iron using hydrocarbons is now commercially practical for the first time. Hojalata Y Lamina, S.A. with the engineering assistance of The M. W. Kellogg Company developed this new process using natural gas. Technically and economically sound, this new process has been proven in a plant at Monterrey which has been producing 200 tons of sponge iron per day for several months. This plant, engineered by Kellogg, is owned and operated by Fierro Esponja, S.A. who have also just awarded a contract to The M. W. Kellogg Company for a second plant which will produce 500 tons of sponge iron per day. This plant will embody several design improvements to increase the thermal efficiency of the process. The reducing gas, which is produced in a Kellogg high-pressure steam reforming furnace, contains 85 per cent hydrogen and carbon monoxide and is sulphur free. Five reforming furnaces will be installed to supply reducing gas for the new plant.



The Fierro Esponja S.A. Plant at Monterrey

This process makes it possible to create a steel industry using iron ore and either natural gas or petroleum and eliminates the need for coal and limestone, major raw materials in the conventional blast furnace. The process requires a much smaller capital investment than that normally associated with the steel industry and can be built economically on a much smaller scale than conventional steel plants. Nations with large supplies of iron ore but limited amounts of coal or limestone will find this process valuable for their industrial development. It will also be of interest to small producers of speciality steels who rely on purchased scrap and pig iron from other producers.

Shell Central Laboratories Reunion

An event unique in the annals of the Shell Group took place on Friday, 17 October, when 116 past and present members of the Central Laboratories' Staff, both men and women, gathered at the Windsor Castle Hotel, London, S.W.1.

It is nearly 40 years since Central Laboratories was formed, with small premises in Bishopsgate and a handful of staff. During all this time it has maintained its identity, even though it has been housed successively at Shell Haven, in the City at 16 Finsbury Circus, at Fulham, at Surbiton, and now in pleasant rural surroundings at Egham. The growth of the Group's business over these years has increased the demand for technical service and has necessitated an increase in the size of the laboratories and of the staff which now number around 170.

In all about 800 people have worked in Central Laboratories at some time or another in the past 40 years and men who gained their first experience in this establishment are to be found in many of the places, all over the world, where Shell operate.

The reunion took the form of a dinner with plenty of time and opportunity both before and after for the renewal of old friendships. Of the people who attended, 20 were members of the present staff, 15 had retired and 81 were former staff still with the Group. Special menu cards were devised for the occasion, showing pictorially on the front the various locations of the Central Laboratories and on the back, by means of pseudo-newspaper cuttings, some of the more important events in its history.

Among those present at the Shell Central Laboratory reunion were (left to right)*: Peter Kerr, J. S. Jackson, P. G. Higgs, J. Parrish, W. R. P. Hodgson, H. Gardner, F. P. Aylett, and D. Morten*

A Shell photograph

Peter Kerr and J. S. Jackson

A Shell photograph

The seal of success of the evening was set for most people by the presence of Peter Kerr—the first manager, well known to many members of the Institute as its Technical Secretary from 1946 to 1952—and J. S. Jackson, his successor, ruler of the laboratories' destinies for 18 years.

In addition to these two, a warm welcome was given to the other former managers, Denis Morten, now heading Training Dept., Shell Refining Co., and W. R. P. Hodgson, personnel manager, "Shell" Research Ltd. The present laboratory manager, P. G. Higgs, acted as host for the evening and welcomed everyone on arrival. He was supported at the top table by the former managers, J. Parrish, assistant manager for many years, F. P. Aylett, chief clerk from the very early days until his retirement a few years ago, and H. Gardner, the present assistant manager.

Of the 81 former staff present there were representatives from a number of Shell Petroleum Co. departments; Shell Refining Co. Head Office, Stanlow, and Shell Haven; "Shell" Research Ltd, Head Office, Thornton, and Woodstock; Shell Chemical Co.; Shell-Mex and B.P., and even one from B.P.M., The Hague. It is interesting to note that two-thirds of those present were engaged during J. S. Jackson's reign and the party included about half the personnel employed in the original laboratory in 1919.

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Khanaqin Oil Company Ltd

With reference to press reports that the Iraq Government has terminated the exploration and producing rights of the Khanaqin Oil Company Ltd, a subsidiary of The British Petroleum Company Ltd, the latter wishes to make it clear that this development is quite in accord with the agreement between the Company and the Iraq Government.

Under an agreement signed in 1951 it was provided that if the Khanaqin Oil Company was unable to commence exports at a rate of not less than 2,000,000 tons of crude oil per annum by February 1959 its rights would terminate. It has not proved possible to do this since, despite much exploration effort since 1951, no further reserves of crude oil were discovered. The Company informed the Iraq Government accordingly and, as required by the provisions of the agreement, its exploration and production rights consequently terminate.

Books and Films

Britain and the Free Trade Area

With the remark that many recent publications and reports on the problems posed for Britain by the advent of the Common Market and the projected Free Trade Area made "long, if not heavy, reading for the layman," the publishers of *Britain in Europe* have set out to provide an alternative to the previous reports.

The booklet has been designed to meet the needs of many businessmen who have asked for a short, clear, summary of the situation, with particular reference to some of the more common objections raised against the whole idea of European economic unity.

The result is an eighteen page pamphlet of admirable clarity, and containing several cartoon-like sketches to illustrate the text, which gives the opinion that the Free Trade Area will act as a stimulant to free competition, thus benefiting especially the smaller firm possessing efficiency, imagination, resourcefulness, and flexibility.

Britain in Europe, by Jossleyn Hennessy, costs one shilling and is published by the Federal Educational and Research Trust, in association with the Britain in Europe Committee.

The Factories Acts 1937 and 1948

The present Factories Act of 1937 (amended by the Act of 1948) makes provision for the safety, health, and welfare of persons employed not only in manufacturing premises of all kinds but also in certain other operations, such as building and constructional work.

Modern industry demands of management a good working knowledge of the Factories Acts and related legislation. The United Steel Companies, recognizing this need, issued in 1945 a summary of the Acts, written in the language of the layman and bringing together in a handy reference booklet the main provisions of the Acts as applied to the Iron and Steel Industry.

This summary has now been revised and brought up to date by the Company's Safety Consultant, N. H. Jones. The booklet may be regarded as authoritative as Mr Jones, an ex-Deputy Chief Inspector, served with H. M. Factories Inspectorate for 42 years.

Copies may be obtained free of charge on application to the Welfare Office, The United Steel Companies Ltd, 17 Westbourne Road, Sheffield, 10.

Podbielniak Industries

On the occasion of the meeting of the American Chemical Society in Chicago, there appears a fifty-page article in Chicago's official publication *This Week in Chicago* which publicises the activities of Podbielniak Inc.

The article, entitled "The Master Puppeteer and the Mystery of the Keys" comprehensively reviews the various industries using Podbielniak contractors in the modernization of their plant facilities. Innumerable photographs illustrate the typical installations operating in such industries as pharmaceutical, petroleum, petrochemical, chemical, metallurgical mining, vegetable oil refining, soap processing, and other industries now using conventional equipment such as centrifuges, fractionating towers, mixers and settlers.

Finally, there is the story of the Podbielniak Institute organized on a non-profit self-sustaining basis for the training of men in industry in such special fields as distillation, gas chromatography, and solvent extraction, which represent the new principles essential to modern technology. There are illustrations of class sessions and an illustration showing instruments and equipment used in the school rooms.

A copy of this booklet is available on request by writing direct to Podbielniak, Inc, 341 East Ohio Street, Chicago 11, Illinois, U.S.A.

New BSI Standards

Mastic Asphalt for Tanking and Damp-proof Courses

Advances in knowledge and technique since the first edition of this standard appeared in 1942 are reflected in this new publication BS 1418: 1958.

It deals with mastic asphalt for tanking and damp-proof courses, composed of crushed and ground natural rock asphalt incorporated with one of two types of asphaltic cement, normally with an added coarse aggregate.

Price of this Standard is 4s 6d. (postage extra to non-subscribers) and may be obtained from the BSI, Sales Branch, 2 Park Street, London, W.1.

Steels for Use in the Chemical, Petroleum, and Allied Industries

This revised series of British Standards for steels has been prepared as part of a comprehensive scheme of codes for pressure vessels for use in the chemical and allied industries. Entitled BS 1501–1506: 1958, there are four separate specifications: 1501, 1503, 1504, 1506—the numerical "gaps" having been left for possible allocation to other forms of material as and when necessary.

This edition deals with plates, bars, and sections, forgings and castings, and bars for bolting material.

BS 1510: 1958 is a companion to the revised edition of BS 1501–1506, and relates to steels for operation at low temperatures and to applications where a high degree of notch ductility is required.

Price of BS 1501–1506 is 25s and of BS 1510 4s 6d.

As Welded and Cold-Drawn Welded Tubes

BS 3014: 1958, a new Standard, specifies requirements for "as welded" and cold-drawn welded tubes manufactured from austenitic stainless steel strip, welded across the abutting edges throughout their length. The price of this Standard is 4s 6d.

Ring Gear Starter in IC Engines

BS 3025: 1958 is to make possible the maximum degree of interchangeability of ring gear starters for internal combustion engines. The price is 7*s* 6*d*.

Pressure regulators for use with butane/propane

Part 1: BS 3016. 1958 for pressure regulators for use with butane/propane gases deals with butane gas pressure-regulators of the type introduced between the gas container and the point of combustion. In the more specific terms of the "scope clause" it specifies: "materials, construction, performance, and testing requirements for low-pressure regulators for butane in the vapour phase up to 20 inch w.g. pressure (51 g/sq. cm)".

The standard requires that "in any one manufacturer's model the corresponding parts shall be interchangeable"—a realistic provision that will be welcomed by the consumer.

The specification concludes with appendices dealing with tests for diaphragms and a full-page diagrammatic sectional illustration of a pressure regulator.

The price is 4*s* 6*d*.

Steel for Land Boilers, Receivers, and other Pressure Vessels

This revised publication, BS 1633: 1958, deals with the plates, sections, bars, rivet bars, and rivets used in the construction of land boilers, receivers, and other pressure vessels. Price of this Standard is 6s.

Plastics Abstracts

One of the most valuable activities of the British Plastics Federation is its service of abstracts of articles and patents of interest in the plastics field.

The most important journals from which the abstracts are taken are available in the Federation library, 47–48 Piccadilly, London, W.1, to all subscribers and copies of articles can be supplied intact in the original journal, or in photostat or microfilm form.

The abstracts have been published monthly since 1945 and are available at a subscription of 10 guineas per annum, post free, printed on one or both sides of the paper.

European Free Trade

Britain, The Commonwealth and European Free Trade, is the latest publication on the subject of the Free Trade Area/Common Market. It attempts to clarify the many issues involved in the proposals for the benefit of U.K. industry. The Commonwealth's dependence on the U.K. in matters of trade, the competition between European and Commonwealth exporters, and the financial problems, are some of the subjects covered within the forty pages.

Prepared by the Economist Intelligence Unit for Britain in Europe Ltd, it can be obtained from the latter body at 61 Catherine Place, London, S.W.1. at a cost of 5 shillings.

U.S. Motor Gasoline Survey

The U.S. national survey of motor gasolines for the winter of 1957–58 has now been published by the Bureau of Mines, U.S. Department of the Interior, Washington. Entitled *Motor Gasolines, Winter* 1957–58 it gives a detailed analysis of the various grades sold in each district of the country. Octane numbers are included in this breakdown the national averages for the period in question being as follows:—

	Regular	*Premium*	*New Grade*
Research ...	90·0	98·0	101·1
Motor ...	83·4	87·8	91·1

An Introduction to Modern Gears

The new Shell-Mex and B.P. film, *An Introduction to Modern Gears* will, it is believed, fill a need as a training aid for schools, technical institutes, and individual industrial concerns operating their own apprentice training schemes.

The style chosen is that of the filmed lecture, and the film gives an excellent description of the function of gears and the various types in use, with an insight into the operational research problems which is taking place in the petroleum and other industries.

The technical advice of Dr H. E. Merritt, internationally known for his work on gear designs, makes it an authoritative film in its field.

Its appearance coincides with the International Conference on Gearing recently held at the Institution of Mechanical Engineers in London.

The film is in black and white, runs for 31 minutes, and is available both in 35 mm and 16 mm gauge.

A still from the 1958 British Grand Prix—*Mike Hawthorn and Stirling Moss chat before the race*

1958 British Grand Prix

Once again Shell-Mex and B.P. Ltd have brought to the screen all the thrills of the motor racing circuit. Their latest production *1958 British Grand Prix* was given its premiere during the London Motor Show period and was highly appreciated by a large audience in Shell-Mex House. Throughout this 20-minute colour film there are some excellent illustrations of the art of motor racing as practised by three of the greatest masters of that art—the late Peter Collins, Mike Hawthorn, and Stirling Moss. The film ends, as the commentator says, as "the slight figure of the courageous Collins takes his leave of the Silverstone scene—gay and smiling as ever—secure in all our memories as one of the truly great".

Made for the Company by Random Film Productions Ltd, the production was supervised by R. F. Leach and H. Hossent and edited by Michael Boyd. Colour is by Technicolour. Copies in 35 and 16 mm gauge are available from Shell-Mex and B.P. film lending library.

Motor Sport Quiz

A novelty in motor sport films is this new production of Shell-Mex and B.P. Ltd. During the past ten years the Company has made many films depicting every angle of the sport—races, rallies, hill climbs, and so on. From these, some highlights and some spectacular events have been taken and the commentator, Nevil Lloyd, invites his audience to test their memories.

As the commentator says: "There are no prizes, and no rules. You can cheat as much as you like because the film gives the answers anyway". But, until the correct answers are given, there is considerable scope for the expert who "knows all the answers". During the preview there was much consternation among the "experts" when the answers came on the screen.

This 16-minute film is available in 35 and 16 mm gauge from the Shell-Mex and B.P. film lending library. It should be found an amusing and entertaining interlude in any film show.

Lectures and Courses, etc.

Foxboro-Yoxall's Training Courses

Foxboro-Yoxall Ltd announce the installation of a training school at their new Redhill factory, as a part of their industrial control instrument service, and to meet the growing demand for training by Foxboro-Yoxall's customers.

The courses to be held there are of three weeks duration and comprise:—

Maintenance Course A—designed to give instrument mechanics with limited experience in industrial instrumentation practical training in the use and maintenance of Foxboro equipment. Emphasis throughout this course is on the practical aspect of the subject.

Advanced Instrument Course B—is designed for technical instrument engineers and covers the theory of control instrumentation and its application to industrial processes.

Special Courses—related to particular user industries, are given from time to time. These have recently included one on instrumentation in the paper industry and another on instrumentation for coal washing plants.

Training in Chemical Engineering

An information sheet entitled a "Note on Graduate Training in Chemical Engineering" has been prepared for graduates by the Council of the Institution of Chemical Engineers in consultation with the Association of British Chemical Manufacturers, in an attempt to assist those who wish to prepare schemes for their graduate trainees.

In addition to a schedule of suggested practical training, there is a list of post-graduate training schemes available.

Details can be obtained from the Institution of Chemical Engineers, 16 Belgrave Square, London, S.W.1.

Mechanical Vibrations

A short postgraduate course on "Mechanical Vibrations" is to be given at the City and Guilds College of the Imperial College of Science and Technology.

This full-time course will be held from 5 January to 23 January and will consist of about 43 lectures, and 25 laboratory or tutorial periods. The basic theory of mechanical vibrations will be reviewed, without resorting to elaborate mechanical detail, and emphasis will be placed on its application to practical engineering problems. Other subjects to be covered will be the propagation of stress waves arising on impact, the theory and practice of dynamic measurement, and the effect of vibration on the properties of materials.

The synopsis of the course includes that of two lectures by Professor D. G. Christopherson, O.B.E., Ph.D., M.I.Mech.E., A.M.I.C.E., on "Vibration in the Field of Friction and Lubrication".

Further information and forms of application may be obtained from the Registrar, Imperial College of Science and Technology, London, S.W.7. The fee for the course is twenty-five guineas and the numbers attending will be limited to twenty-five.

Lectures on Refractories

The Borough Polytechnic, Borough Road, London, S.E.1. are holding a course of ten lectures on *Refractories, Their Manufacture, Properties and Applications* to be given by L. R. Barrett, M.A., B.Sc., M.S., A.R.I.C., M.Inst.F., F.Inst.Ceram. The course is being held on Fridays at 7.0 p.m. starting on 10 October 1958.

Applications for enrolment can be obtained from the secretary of the College, the fee being £1.

Faraday Lecture

The 1958/59 Faraday Lecture on "Automation" is to be presented by Dr H. A. Thomas, M.Sc., M.I.E.E., S.M.I.R.E., manager of the Instrumentation and Control Section of Unilever's Engineering Department.

The lecture is intended primarily for a non-technical audience but it is hoped that it will interest qualified personnel also.

A synopsis of the lecture has been released by the Institution of Electrical Engineers, Savoy Place, London, W.C.2., together with a list of the places and dates at which the lecture is to be given throughout the U.K. The London presentation will take place at the Royal Festival Hall, 26 January 1959, at 6 p.m., tickets being available in December. Admission to each lecture is free by ticket obtainable from the address given in the published list.

Instrumentation and Computation Symposium

It has been announced that the joint symposium on Instrumentation and Computation in Process Development and Plant Design, organized by the Institution of Chemical Engineers, the Society of Instrument Technology, and the British Computor Society, under the aegis of the British Conference on Automation and Computation, is to be held at Central Hall, Westminster, London, S.W.1. on 11, 12, and 13 May 1959, and not in April as stated on the programme card.

International Geological Congress

The first circular has been received giving details of the Twenty-First Session of the International Geological Congress to be held in the Scandinavian countries in 1960. The sessional meetings are to take place in Copenhagen with headquarters in the Mineralogical-Geological Museum of the University of Copenhagen.

Information can be obtained from: The Organizing Committee, Mineralogisk Museum, Oster Voldgade 7, Copenhagen K, Denmark.

Essays and Papers on Corrosion Science

The Education Panel of the Corrosion Group, with the approval of the Council of the Society of Chemical Industry, established in 1955 a competition designed to encourage those who are still in the early stages of their career to take an interest in corrosion science and to express their ideas in writing. A prize to the value of 25 guineas will again be awarded this year for an essay or paper on any aspect of corrosion of metals and its prevention.

Essays are invited from persons aged not more than 27 years on 31 March 1959, the closing date, and a length of about 4000 words is suggested.

Judgment of the entries by judges appointed by the Education Panel Committee will be based on the evidence shown of the candidate's critical faculty and originality of thought, and on technical and literary excellence generally. Results of original research may be incorporated, but this is not essential; entries may consist, for example, of surveys of knowledge in a particular field, discussion of practical problems, and suggestions for future developments in research, in application of knowledge, or in organization of corrosion-preventive measures. Where the work or ideas of others are referred to, clear acknowledgment must be made.

Details can be obtained from Society of Chemical Industry, 14 Belgrave Square, London, S.W.1.

Trade Literature, etc.

New Manometer Design

A manometer which can be simply and quickly arranged for flush panel, wall mounting or, with special stand, for laboratory bench work, has been developed by Refinery Equipment and Speciality Co. Ltd, Eccles, Manchester. The instrument is intended for the measurement of pressure, differential pressures, and levels at system pressures up to 100 p.s.i.g. Each instrument is tested to 200 p.s.i.g.

Special features of the equipment include the provision of two line isolating valves and one equalizing valve, fully shock-proof construction and a simple, foolproof system for filling and venting the measuring fluid used.

R.E.S. Co. 12 inch scale Manometer is shown here fitted with a special stand for laboratory bench work.

Castrol Anti-Freeze

The makers of Castrol Motor Oil announce the introduction of *Castrol Anti-Freeze*, now available at garages throughout the country. The outstanding feature of this product, the makers claim, is its unique anti-corrosion properties. These are conferred by a new exclusive additive. *Castrol Anti-Freeze* is recommended by the company not only for petrol engines but also for diesel engines which may be subject to extremely severe corrosion problems and which, in the past, often required a special type of anti-freeze.

Castrol Anti-Freeze is an ethylene glycol based product ensuring complete frost protection and, the makers state, is the result of exhaustive research and practical selling experience in Canada and other countries where extremes of cold are met.

Whessoe Contract For Nuclear Pressure Vessel

As announced at the recent Geneva Conference the UKAEA is to proceed with an advanced type of gas cooled graphite moderated reactor. Whessoe Ltd are to be awarded the contract for the supply and construction of the reactor pressure vessel, which will operate at considerably higher temperatures than those employed on nuclear power stations currently under construction.

The advanced gas cooled reactor pressure vessel containing the core and moderator is a vertical cylinder and approx. 21 ft diameter with hemispherical top and bottom heads. Its overall height is 53 ft 6 in. and its is to be constructed from notch ductile steel plate of considerable thickness. The top head is perforated by a large number of closely pitched charge tube and control rod standpipes for refuelling and controlling the reactor.

The internals include the support of the heavy core and graphite moderator and the shielding material. The internal baffles are arranged in such a manner that the relatively cool inlet gas sweeps the entire pressure vessel shell. The hot gas is collected from the reactor channels and passes out of the reactor through an inner concentric duct. This prevents it being in contact at any point with the vessel shell.

This nuclear reactor vessel will be the twelfth to be built by Whessoe whose first contract for a reactor pressure vessel was secured in 1953. The eleventh in the series of reactor vessels is the 66 ft spherical pressure vessel to be built at Latina, south of Rome, for the Italian power station contract recently secured by the Nuclear Power Plant Company of which Whessoe Ltd is a member company.

Stordy-Hauck Oil Burning Equipment

Stordy Engineering Ltd, Cumbria House, Goldthorn Hill, Wolverhampton announce that they are now able to provide to industry the complete range of the Hauck designed fully proportioning oil burner, together with the special ancillary equipment which has been developed by the Hauck Organization of America. Descriptive leaflets can be obtained from the Company.

Foden MK III Engine

The New Foden two-stroke oil engine which is being installed in their current range of commercial vehicles, is a development of the previous MK II range to give higher power output and longer life.

The development of the MK III engine from earlier models is mainly concerned with the crankshaft and bearing assembly. Whereas earlier models had white metal main and big end bearings contained in heavy steel shells, the MK III engine has lead/indium flashed copper lead thin shell bearings.

In addition to the modifications designed to increase the operating speed of the MK III range, the engine has been improved in a number of details. For example, the fuel pump camshaft is now lubricated from the engine lubricating oil pump and the fuel filters are situated on the pressure side of the fuel lift pump. A collector system for injector leak-off is noticeable together with a combined oil filler and breather.

The Company exhibited the MK III engine on their stand at the recent Commercial Motor Show at Earls Court.

Amsterdam Catalyst Manufacturing Plant

A new plant for making platinum reforming catalyst for the oil industry started its production in Amsterdam in August 1958.

Built and managed by Ketjen, the plant is the first enterprise of Cyanamid-Ketjen NV, a new 50/50 subsidiary of American Cyanamid Co., New York and Ketjen, Amsterdam.

The plant adjoins Ketjen's plants for making m.s. fluid cracking catalyst *Ketjencat*, fluid hydroforming catalyst *Ketjenform*, and hydrodesulfurization catalyst *Ketjenfie*.

The Ultraforming catalyst will be marketed under the trade names C-K 103, and C-K 106, for the 0·3 per cent and 0·6 per cent platinum types respectively. The product is identical with *Aeroform PHF* 1 as produced by American Cyanamid Co. in its Willow Island plant.

Industrial Diesel Engines

Perkins three, four, and six cylinder industrial diesel engines were being exhibited at the Public Works and Municipal Services Exhibition at Olympia from 10 to 15 November. The latest addition to the Perkins industrial engines—the new 1·6 litre "Four 99"—is being shown at the exhibition. The Four 99 is suitable for a wide range of small industrial equipment, including lighter types of fork lift trucks, compressors, generators, dumpers, pumping sets, and cranes.

The Peterborough diesel engine company is supplying nearly 200 British and overseas manufacturers with industrial engines as first equipment.

Features of the Four 99 include a rotary-type fuel pump and a new patented combustion system permitting better performance throughout the wide engine range. The upper part of the combustion chamber is hemispherical in shape and is machined into the cylinder head. The lower half of the chamber is formed by an inserted machined plug, which contains the throat connecting chamber to cylinder. Fuel is injected into the combustion chamber by means of a pintle type nozzle.

Nearly 50 Perkins diesel engines were displayed at the Commercial Motor Show at Earls Court, and at least eight new vehicle models at the exhibition were powered by engines made by F. Perkins Ltd, of Peterborough.

H.P. Fullway Valves

Hydraulics and Pneumatics Ltd, Wulfruna Works, Villiers Street, Wolverhampton, have announced details of their H.P. Fullway Valves which are new to the U.K. Designed for positive trouble-free operation, they have a smooth full way passage which, the manufacturers claim, makes them ideal for operation on viscous and gritty liquids. They are operative in either direction of flow, and the tight seal permits no leakage whatever on liquids or gases at listed duties. The absence of internal lubrication ensures that liquids or gases passing through are uncontaminated. There is complete absence of wearing parts, and the moving parts are not in contact except through seals, which are available in a variety of materials to suit particular service requirements.

H.P. Fullway Valves are supplied in sizes ranging from 5/32 in to 8 in diameter to meet the specific requirements of most industries. In the small sizes, the valves are suitable for pressures up to 5000 p.s.i.

Petrol Stations For Nigeria

A trick of design and prefabrication by Coseley Standard Buildings of Wolverhampton is resulting in petrol filling stations for two leading petroleum companies being built in double quick time.

It all began with a request from Nigeria where there is a demand for modern distribution services in locations remote from the larger cities.

Two prototypes have been made. Both are constructed mainly of aluminium and polyester fibre glass, and the larger one houses an office, a showroom area, a store with air compressor, and toilet and washroom facilities.

Both models are crated complete and ready for immediate erection.

Four men can erect the larger station in four days with ease and the smaller model (above) will occupy two men for a period of two days.

Acid Protection

After considerable research Boase Spinning Co. Ltd. have developed in their own laboratories a new type of protection against sulphuric acid attack on cloth. The new development increases the life of canvas on oil-burning ships exposed to acid burns caused by sulphurous sooty particles from the ship's smoke stack, by three times.

The Company's laboratories formulated a proofing which, in addition to a tough outer skin of plastic, also incorporated acid-neutralizing chemicals within the fibres of the flax canvas. Water repellent and rot-resisting agents are also incorporated in the canvas, which is called *Aptex*. The cost is between 20 and 30 per cent more than ordinary canvas, but it is claimed that it lasts far longer.

A pamphlet describing the new development has been printed by The Boase Spinning Co. Ltd. Rockwell Works. Dundee, and copies will be sent to any enquirers.

Flexibox Appointments

Flexibox Limited, manufacturers of mechanical seals for rotary shaft equipment, announce that they have appointed Messrs John Turner & Co., 25 Collingwood Street, Newcastle-on-Tyne, 1, as agents for the north eastern area of Gt Britain.

G. L. Towers, B.Sc., has been appointed sales engineer, to be based on Birmingham. He will be responsible for sales and service in the Midlands area.

[*Continued on next page*]

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Situations Vacant

Air Ministry Works Design Branch requires in **London, Designer Draughtsmen for Bulk Petroleum Storage and Pumping Installations** experienced in one or more of the following:—

(a) Storage tank layout and design;
(b) pump house and plant layout;
(c) development of pipe line schemes;
(d) hydraulic calculations.

Technical training to O.N.C. standard required. Salaries up to £1015 p.a. Starting pay dependent on age, quals. and exp. Long term possibilities with promotion and pensionable prospects. 5 day week, 3 weeks 3 days leave a year. Normally natural born British subjects. Write stating age, quals., employment details including type of work done, to any Employment Exchange quoting Order No. Borough 105.

British Petroleum Company Ltd has a vacancy for a **Bitumen Technologist** at its Head Office in London. Applicants aged 30–40 must have degree in Chemistry or Engineering or A.M.I.C.E. Experience in the use of Bitumen is essential and some knowledge of protective coatings desirable. Duties will be concerned primarily with technical aspects of the application of bitumen in road making and in industry. Salary according to age, qualifications and experience, non-contributory Pension Fund, assisted House Purchase Scheme. Removal expenses and settling-in allowance payable in certain cases. Luncheon Club. Write, giving full particulars, quoting H.4510A to Box 5904 c/o 191 Gresham House, E.C.2.

AUSTRALIAN DEFENCE SCIENTIFIC SERVICE

LUBRICANTS AND FUELS

The Defence Standards Laboratories of the Department of Supply, Melbourne, invite applications for a position of

SENIOR SCIENTIFIC OFFICER

Salary: £2,116/2,281 (Australian).

Duties: Research and Development work in the fields of fuels and lubricants. Take charge of a section which provides a consultive and advisory service on fuels and lubricants to the Services and to Government production and Transport authorities which engage in research into the performance of these materials.
The work involves close collaboration with the petroleum industry as suppliers and with user organizations.

Qualifications: Honours degree in chemistry, or other qualifications and research achievements considered the equivalent. Experience in research and development on fuels and lubricants essential.
A knowledge of automotive engineering desirable.

Although the position is classified as temporary the tenure of employment is not limited and after a period of three (3) years the successful candidate would be eligible to apply to contribute to the Superannuation Fund.

Under specific conditions first-class sea or air fares (if first-class berths available) for successful applicant and dependants (wife and dependent children) will be paid by the Commonwealth.

As an alternative to normal temporary employment conditions the successful candidate may choose to enter into an agreement for a five (5) years contract of employment in Australia.

In this case the Commonwealth will bear return fares for the appointee and dependants together with the cost of removing each way the appointee's furniture and effects up to a maximum of £500 (Australian); £250(A) each way.

Application forms obtainable from:

Senior Representative, A.V.8/10,
Department of Supply,
Australia House,
Strand,
LONDON, W.C.2.

by 17 December, 1958.

Refinery Pipeline Replica

One of the companies exhibiting at the Scottish Electro Heat and Productivity Exhibition held in the Kelvin Hall, Glasgow, from 10-14 November was the Lincoln Electric Co. Ltd.

The Company stand included a replica of a petroleum refinery pipeline with demonstrations of pipe welding using *Fleetweld* 5, Shield-Arc 85, and other Lincoln electrodes.

Exhausters and Boosters

A brochure has been published describing the Holmes-Connersville exhausters and boosters Type XAS. The machines are said to be of simple design, having no moving vanes, valves, springs, or other small parts to work loose, become noisy, or wear out. No internal lubrication is required, as a small clearance is arranged between the revolving impellers and the surrounding casing. Due to this small clearance no water or other sealing liquid is required for normal rated service; consequently the gas does not pick up oil, oil vapours, or excess moisture.

Copies of this brochure, Publication No 75, may be obtained from the Advertising Department, W. C. Holmes and Co. Ltd, P.O. Box No. B7, Turnbridge, Huddersfield.

Change of Address

Acheson Industries (Europe) Ltd. announced their new address as 1 Finsbury Square, London, E.C.2. (Tel: MONarch 5811).

Silica-Graphite Paint

A new high-duty industrial paint manufactured by C. R. Averill Ltd, Alyn Mills, Caergwrle, Wrexham, N. Wales has recently been announced.

Wonderware silica-graphite paint is designed primarily for the protection of structural steelwork and being made on a full oil basis, is suitable for use either as undercoatings or finishing coats.

A technical information sheet and a colour card are available from the manufacturers.

Philips "Magna-Drum"

Philips Electrical Ltd, Century House, Shaftesbury Avenue, London, W.C.2, have announced a new range of coolant clarifiers, the heart of which is a magnetic drum of unique design called the *Magna-Drum*.

As a result of the development by Philips of ceramic magnetic materials, it has become possible to produce a drum which is highly magnetic over its entire surface—a distinct advance upon conventional drums which normally use horseshoe type magnets cast in steel and encased in a non-ferrous cylinder. The *Magna-Drum* has no such enclosure to restrict its magnetic field. Furthermore, it is claimed that its magnetic field is so intense and the cutting oil or soluble oil coolant to be filtered so controlled, that a high proportion of grinding abrasive is always contained in the swarf collected on the drum's surface The swarf is removed by specially designed scrapers.

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Forthcoming Meetings

THE INSTITUTE
(*At* 61 *New Cavendish Street, London, W.*1., 5.30 *p.m.—tea* 5 *p.m.*)
Petroleum-Based Launching Lubricants. G. H. Clark and D. A. Davidson. **7 January**

IP Economics and Operations Group
(*At* 61 *New Cavendish Street, London, W.*1., 5.30 *p.m.—tea* 5 *p.m.*)
The Design of Road Tank Wagons. A. R. E. Calcott. **11 December**
Developments in the Middle East. Brig. S. H. Longrigg. **8 January**

IP ESSEX BRANCH
(*At Railway Hotel, Pitsea*, 7.30 *p.m.*)
Fuel of the Future. R. S. Hopper and C. P. Humphris, M.A., A.M.Inst.F. **17 December**
Dinner-Dance (*At Middleton Hotel, Southend-on-Sea*, 8 *p.m.*) **16 January**
Annual General Meeting. (7 *p.m.*)
Exploration of the Andes. J. C. Jewell. **19 January**

IP FAWLEY BRANCH
(*At Esso* (*Fawley*) *Recreation Club, Holbury*, 7.30 *p.m.*)
Atomic Achievements. T. A. Hall, Ph.D., D.I.C., A.R.I.C., A.M.I.Chem.E. **17 December**
Annual General Meeting. Films in the Oil Industry. R. F. Leach, M.A., F.R.G.S. **21 January**

IP LONDON BRANCH
(*At* 61 *New Cavendish Street, London, W.*1, *at* 6 *p.m.—tea* 5.30 *p.m.*)
Film Evenings at Shell-Mex House. **5 and 12 December**
Social Evening (*At Chatham Rooms Restaurant*) **22 January**

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IP NORTHERN BRANCH
Film Show. (*ABC Television Theatre*) and **Hot Pot Supper.** (*Old Nag's Head Hotel*) **9 December**
(*At Engineers' Club, Albert Square, Manchester* 2, 6.30 *p.m.*)
Modern Business Methods **20 January**

IP SCOTTISH BRANCH
(*At North British Hotel, Edinburgh*, 7 *p.m.*)
The Performance of High-Speed Diesel Engines. J. G. Withers (Joint Meeting with the Institute of Fuel, Scottish Section) **16 December**
(*At Recreation Hall, BP Grangemouth Refinery*, 7.30 *p.m.*)
Annual General Meeting (7 *p.m.*) **Film Evening** **22 January**

IP SOUTH EASTERN BRANCH
(*At King's Head Hotel, Rochester*, 7.45 *p.m.*)
Annual General Meeting. Film Show. (7.30 *p.m.*) **6 January**

IP SOUTH WALES BRANCH
(*At the Training Centre, BP Refinery* (*Llandarcy*) *Ltd*, 5.30 *p.m.*)
The Problem of Air Pollution. Professor W. G. V. Balchin M.A., Ph.D., F.R.G.S., F.R.Met.S. **11 December**
Films in the Oil Industry. R. F. Leach, M.A., F.R.G.S. **8 January**

IP STANLOW BRANCH
(*At Blossoms Hotel, Chester*, 7.30 *p.m.*)
Operation Pluto. A. C. Hartley, C.B.E. **17 December**
Annual General Meeting. (7 *p.m.*) **Operational Research and Electronic Computers.** D. A. Caplin and G. W. Sears. **21 January**

IP YORKSHIRE BRANCH
(*At Queens Hotel, Leeds*, 7 *p.m.*)
First Annual General Meeting. Address by the President. **15 January**

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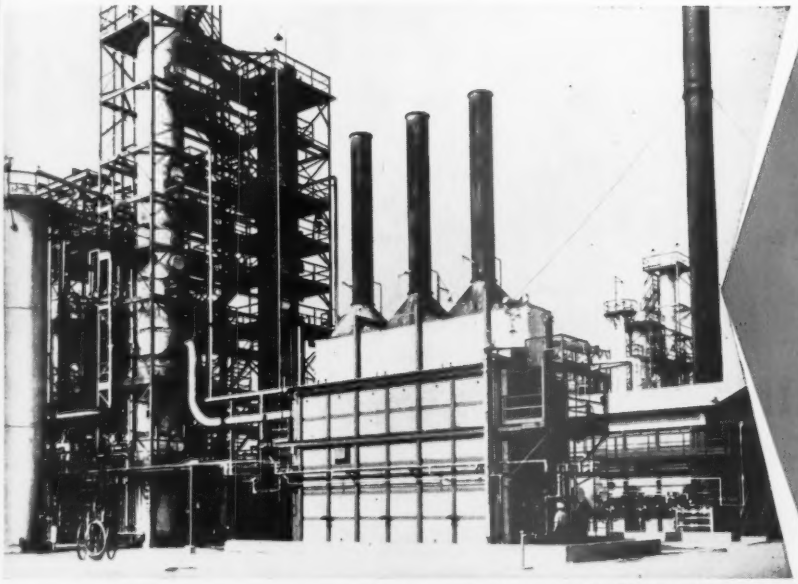

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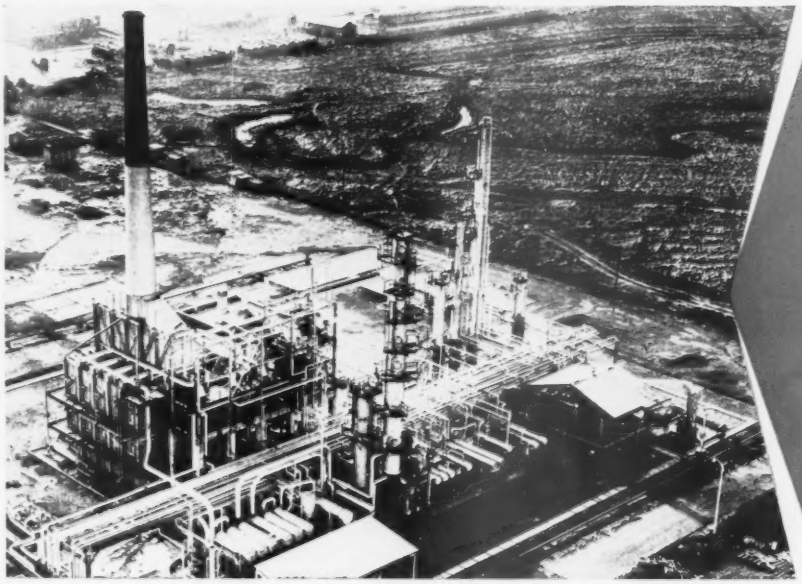

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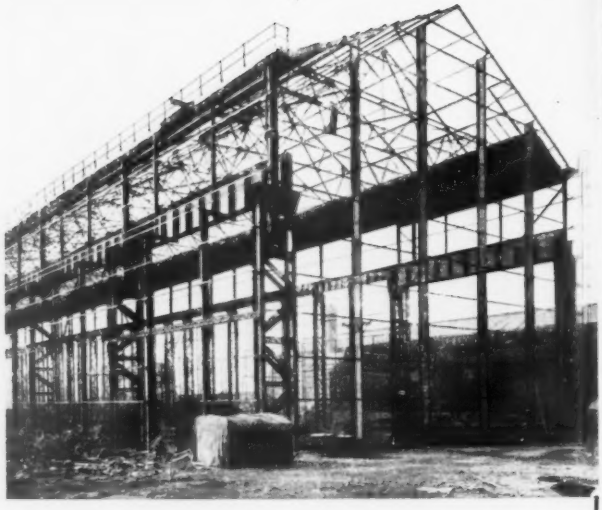

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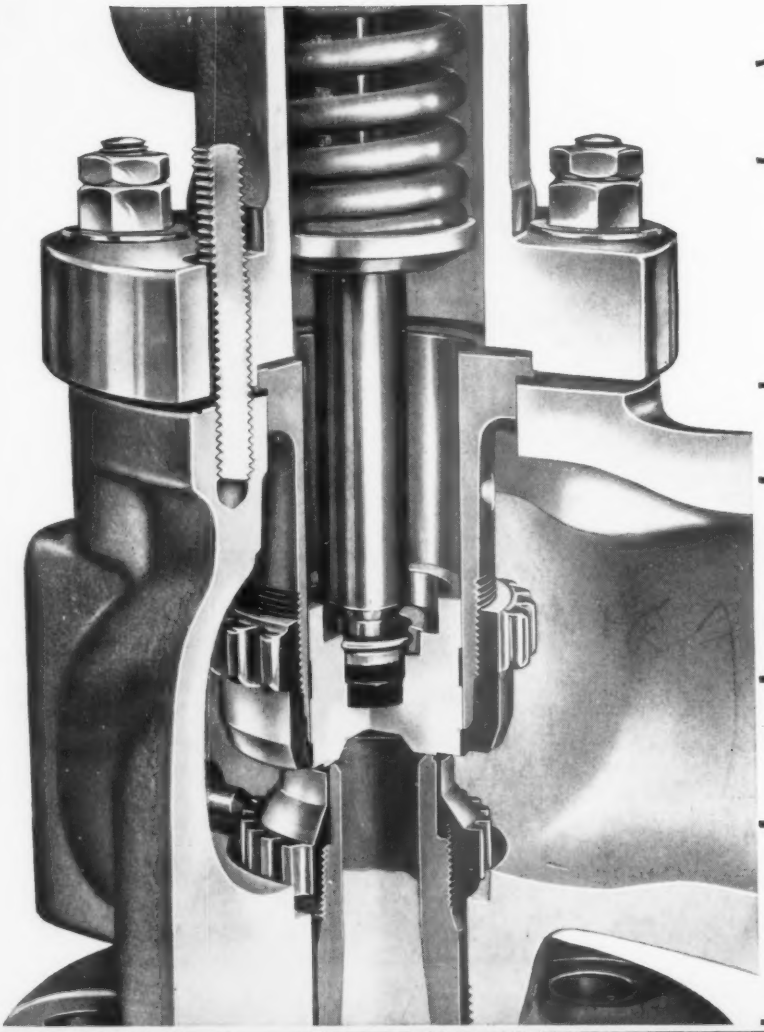

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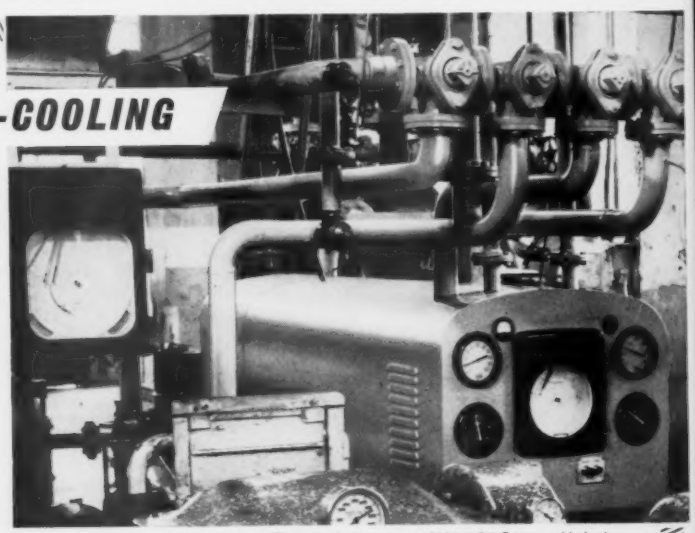

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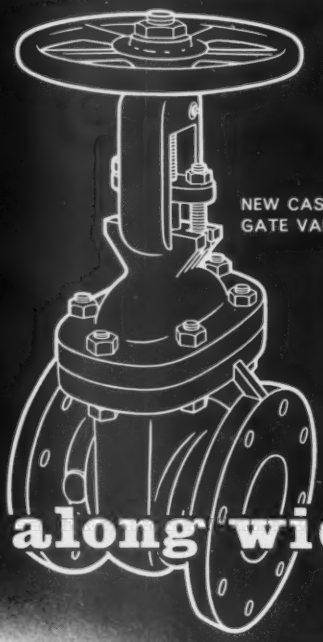

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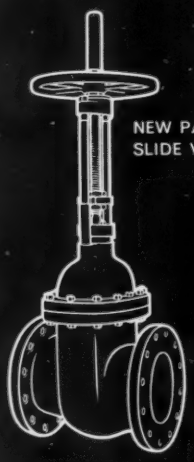

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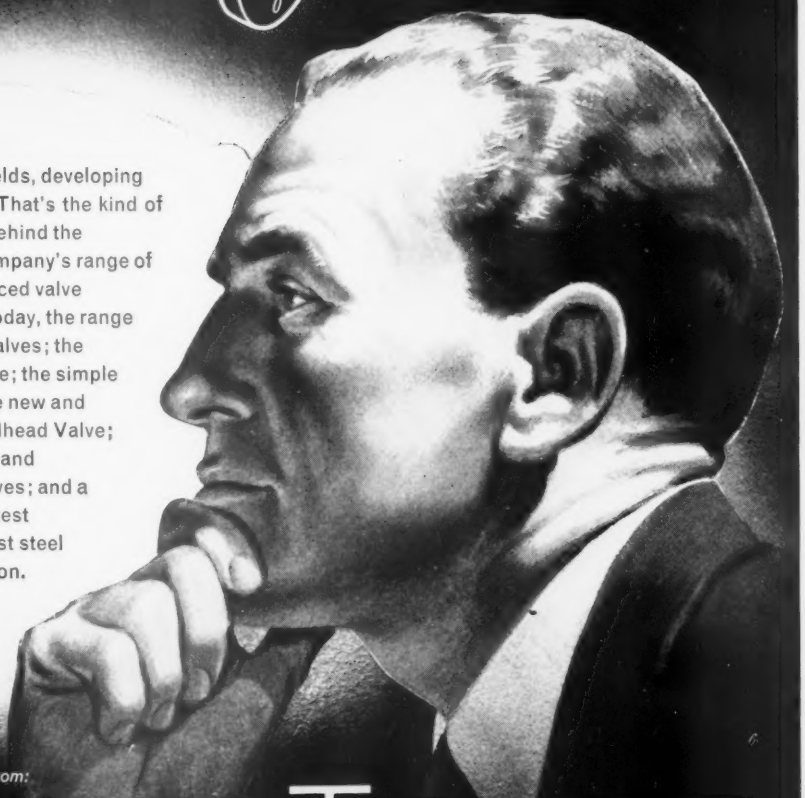

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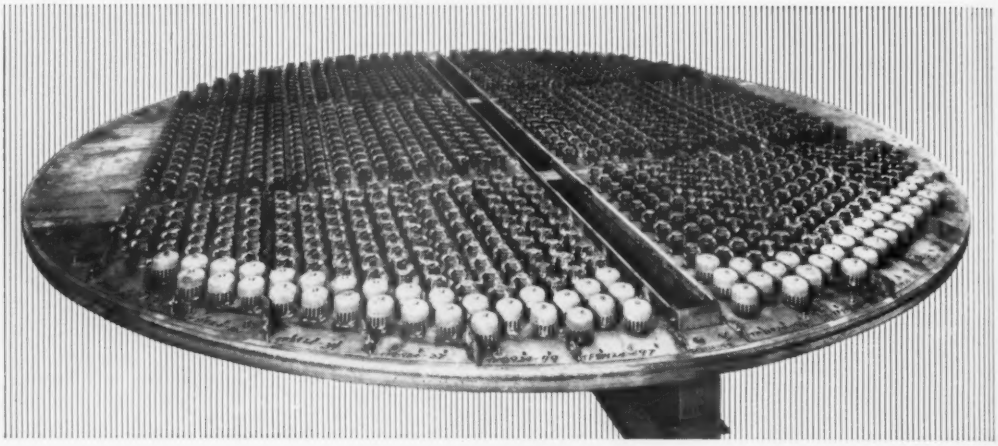

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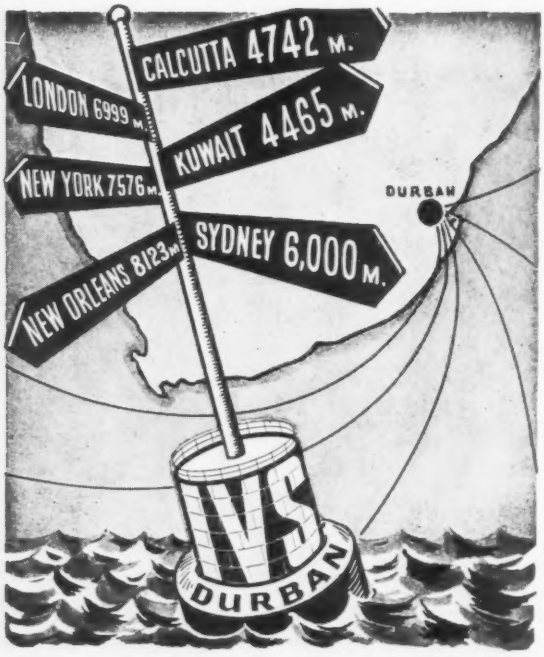

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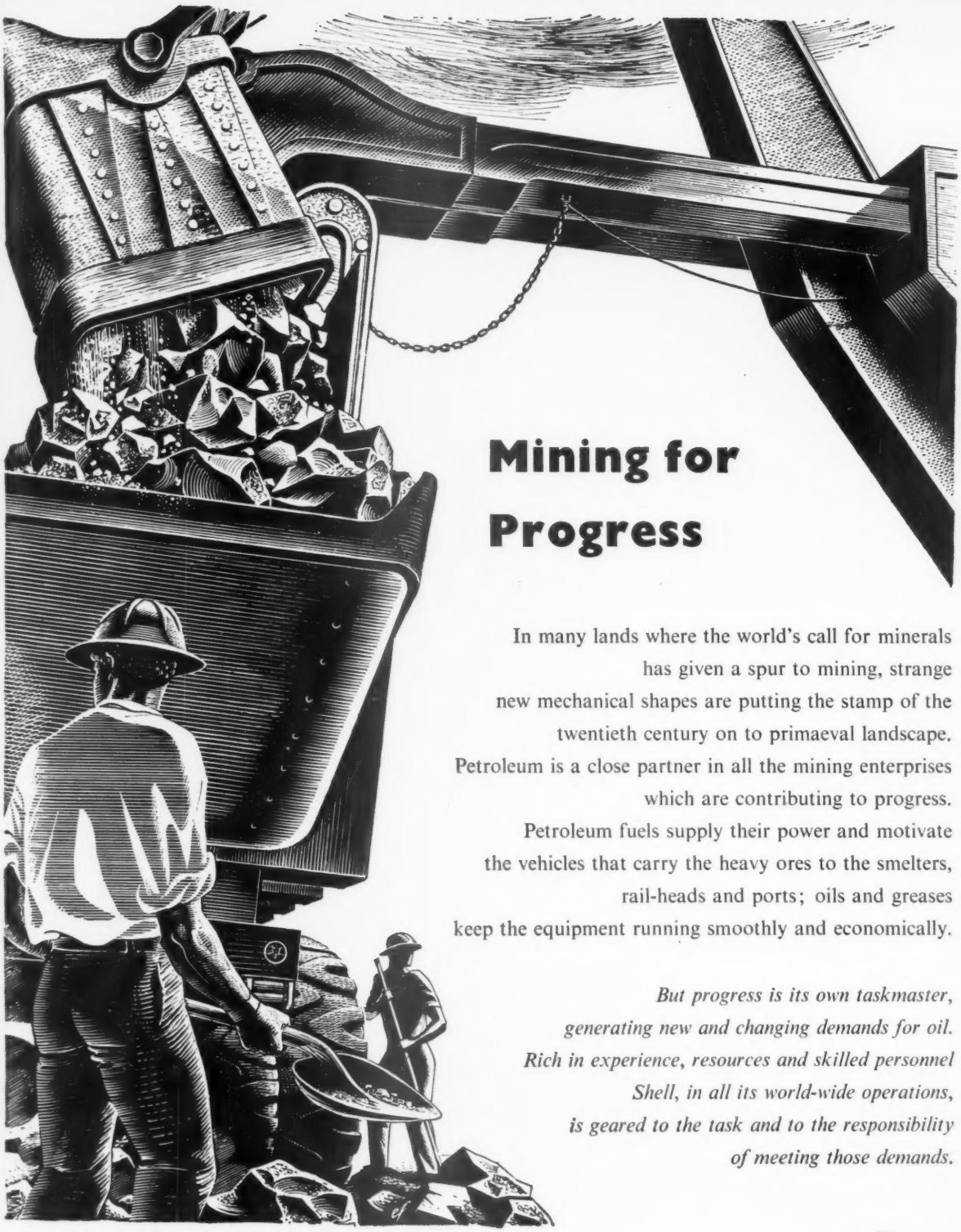

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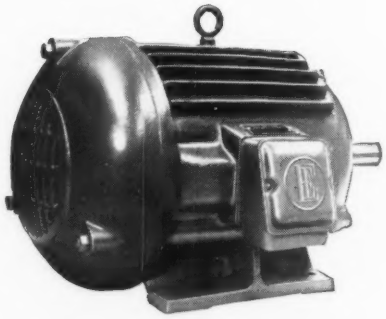

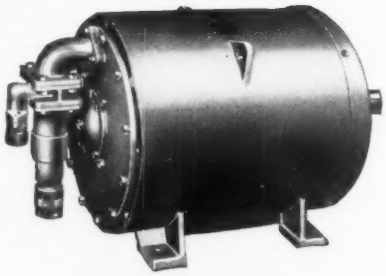

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A. Gallenkamp & Co. Ltd *(D. J. Mackridge & Partners Ltd)*	Nov.
General Descaling Co. Ltd *(Olerichs Advertising Ltd)*	June
General Electric Co. Ltd, The *(Smee's Advertising Ltd)*	vii
General Refractories Ltd *(John Mitchell & Partners Ltd)*	June
Geophysical Prospecting Co. Ltd	May
Granthams (Leatherhead) Ltd	May
Griffin & George (Technical Services) Ltd	Nov.
G. S. Hall Ltd *(Industrial Publicity Service Ltd)*	Nov.
Matthew Hall & Co. Ltd	xii
John Harper & Co. Ltd *(Rowlinson-Broughton)*	Nov.
Hayward-Tyler & Co. Ltd *(J. P. McNulty & Co. Ltd)*	Nov.
Joshua Hindle & Sons Ltd *(Storey, Evans & Co.)*	June
W. C. Holmes & Co. Ltd *(Cross-Courtenay Ltd)*	Nov.
Honeywell Controls Ltd *(T. G. Scott & Son Ltd)*	Oct.
Hughes Tool Co. *(Foote Cone & Belding Ltd)*	June
Hydronyl Syndicate Ltd, The	xviii
International Paints Ltd *(Mayfair Advertising Ltd)*	Nov.
Island View Storage (Pty) Ltd *(Richard F. Robinow)*	xviii
Jerguson Tress Gage & Valve Co. Ltd *(J. Peers & Associates Ltd)*	June
A. Johnson & Co. (London) Ltd *(A.T.A. Advertising Ltd)*	xvi
S. H. Johnson & Co. Ltd *(Mayfair Advertising Ltd)*	Nov.
Kellogg International Corporation *(Reynell & Son Ltd)*	x
Lake & Elliot Ltd *(Ripley, Preston & Co. Ltd)*	Nov.
J. & T. Lawrie Ltd *(Doig Advertising Ltd)*	xvi
Le Grand Rochester Ltd *(K. S. Advertising Ltd)*	June
Lincoln Electric Co. Ltd *(London Press Exchange Ltd)*	June
London & Thames Haven Oil Wharves Ltd	xi
M. & C. Switchgear Ltd *(Rex Publicity Service Ltd)*	Nov.
A. & J. Main & Co. Ltd *(Hannaford & Goodman Ltd)*	xiv
Mannesmann Export G.m.b.H. *(Publicitas G.m.b.H.)*	June
Metal Containers Ltd *(Murray-Watson Ltd)*	Back Cover
Metal Propellers Ltd *(Hall Publicity Ltd)*	xviii
L. A. Mitchell Ltd *(Wilson Advertising Ltd)*	ix
Mobil Oil Co. Ltd *(Masius & Ferguson Ltd)*	Nov.
Motherwell Bridge Contracting & Trading Co. Ltd	xxiii
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Newman, Hender & Co. Ltd *(Adams Bros & Shardlow Ltd)*	June
Nicerol Ltd *(Townend-Smith & Hardy Ltd)*	June
F. Perkins Ltd *(Crane Publicity Ltd)*	Oct.
Petrolite Corporation *(Batz-Hodgson-Neuwoehner)*	Nov.
W. Press & Son Ltd *(Kingham Advertising Agency)*	Nov.
Pyrene Co. Ltd *(Nelson Advertising Service Ltd)*	Sept.
John Rabone & Sons Ltd	Sept.
Rotork Engineering Co. Ltd *(Trowbridge, Pritchard & Co. Ltd)*	viii
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Shell Petroleum Co. Ltd *(Grahame & Gillies Ltd)*	xix
Simmons & Hawker Ltd *(Broadway Advertising Service Ltd)*	Nov.
South Durham Steel & Iron Co. Ltd *(John Slater (Advertising) Ltd)*	June
J. Stone & Co. (Charlton) Ltd	June
Peter Spence & Sons Ltd *(Holmwood Advertising Ltd)*	Nov.
Stewarts and Lloyds Ltd *(H. Raymond Morgan)*	June
Stone & Webster Engineering Ltd *(Thames Advertising Service Ltd)*	Inside Back Cover
Stothert & Pitt Ltd *(Trowbridge Pritchard & Co. Ltd)*	Nov.
Taylor Controls Ltd *(D. J. Keymer & Co. Ltd)*	May
John Thompson Ltd *(Rowlinson-Broughton)*	June
Trent Valve Co. Ltd *(Walter Judd Ltd)*	June
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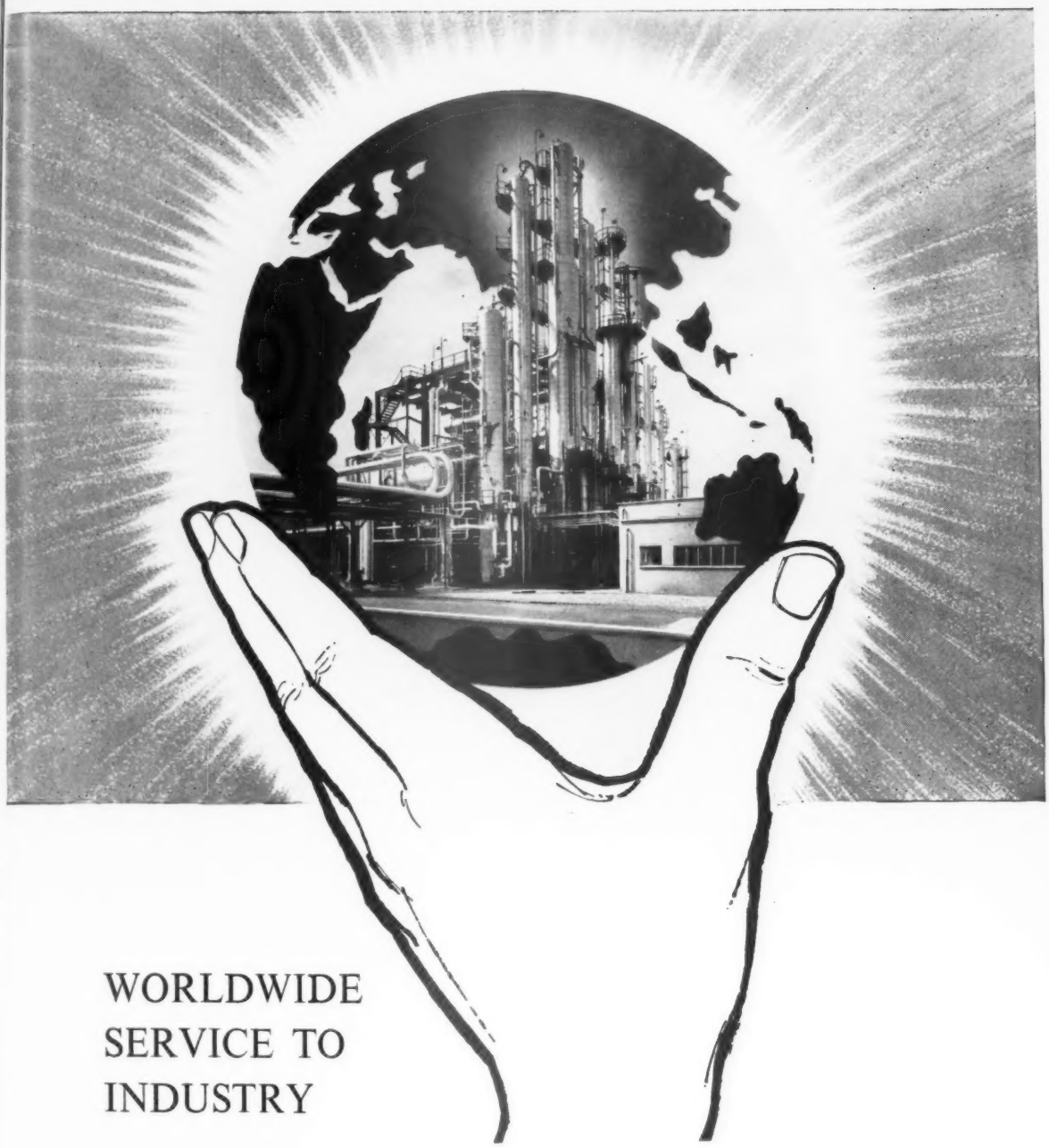
Wellington Tube Works Ltd *(L. Graham Browne Advertising Ltd)*	June
West's Piling & Construction Co. Ltd	Oct.
Whessoe Ltd	v
Woodfield Rochester Ltd *(K.S. Advertising Ltd)*	June



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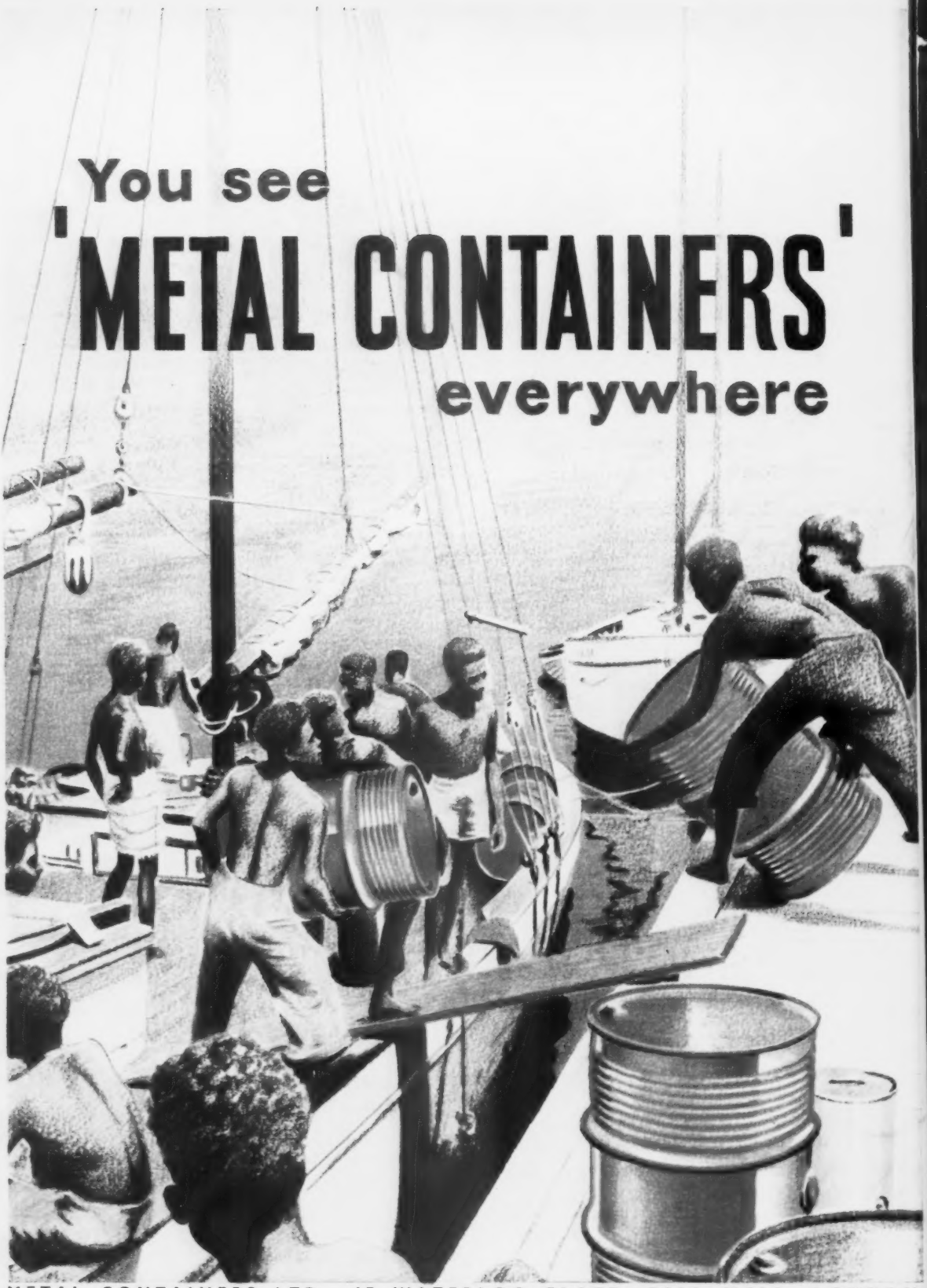

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